# The Contributions of Model Forest Organizations towards Governance for Sustainable Forest Management of Small-scale Forests: Lessons from Eastern Ontario and Kyoto Model Forests

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By

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## ABSTRACT

The Model Forest (MF) concept emerged in Canada in the early 1990's to promote partnership arrangements for the sustainable governance of forest landscapes. Since then, the concept has grown internationally, attracting interests from both policy-makers and researchers. Internationally, MF arrangements provide a platform not only for fostering multi-level governance arrangements but also to act as bridging organizations that facilitate the interaction of multiple actors from the state, market and community to achieve sustainability within specific socio-ecological landscapes. For instance, in some jurisdictions, the role of MFs in facilitating partnership arrangements between local communities and markets described as private-social partnership arrangements to enhance the sustainable management of forests has been noted. However, our understanding of the effectiveness of MFs in promoting private-social partnership arrangements for the sustainable management of small-scale forests across different institutional settings is less well known. Hence, this thesis examines the effectiveness of Model Forests (MF) as bridging organizations that facilitate the participation of small-scale foresters in private-social partnerships to achieve sustainability in forest landscapes. Consequently, two MF organizations including the Kyoto Model Forest Association (KMFA) in Japan, and the Eastern Ontario Model Forest (EOMF) in Canada, both with a similar focus on small-scale foresters were selected as case studies. The objectives of the research were: (a) assess the effectiveness of MFs as bridging organizations in convening private-social partnership arrangements to improve local socio-ecological sustainability; (b) assess the effectiveness of MFs as bridging organizations to improving the effective participation of local actors in private-social partnership arrangements; (c) examine how MFs can improve local dimensions of well-being linked to ecosystem functioning; and (d) consider the implications of private-social partnerships in multi-level forest governance arrangements for the sustainable management of small-scale forests. Data was collected using a mixed-method approach involving document analysis, semi-structured and group interviews, a questionnaire survey, and field observations.

Two key findings emerged from this research. First, both MFs performed several bridging or intermediary functions that improved the effectiveness of private-social partnership arrangements for improved socio-ecological system governance. In the Kyoto case, the findings showed that the KMFA designed and aligned private-social partnership arrangements involving collaboration between private non-forest corporations, local governments, and local forestry associations to improve the management and conservation of rural underutilized forest landscapes. Specifically, the KMFA improved the effectiveness of partnership

arrangements through the provision of public education to broaden participation; investing in places and systems to reduce participation costs; building trust and reducing value mismatches; providing incentives and building management capacity; and providing leadership to draw on the skills, knowledge and resources of diverse organizations. In the Ontario case, the EOMF promoted the effective participation of small-scale private foresters in a market-based forest governance arrangement by drawing on its social capital – networks and trust – to access required management skills and run the program at a relatively low cost; providing specialized locally relevant forestry services required by local actors; and, innovating and adapting to program changes and stakeholder demands. Thus, in both cases, the MFs improved the effectiveness of private-social partnership arrangements by reducing challenges to participation for different actors, leveraging on its network to improve access to resources and skills, defining roles and responsibility of various actors to improve cooperation and coordination, and optimizing broader governance arrangements to align with the needs, interests and preferences of actors, particularly local actors.

Second and finally, the findings showed that both MFs served as catalyst to generate capabilities that improved forest-ecosystem interdependence and local dimensions of well-being dependent on ecosystems. Acting as spaces for collective action, both MFs helped to define and align common goals and interests, and the freedom to act, thereby expanding the choices and capabilities of actors. Specifically, both MFs enhanced the capability set of actors relative to livelihoods and activities; knowledge and technology; relationships building and coordination; and freedom and voice. Collectively, these capabilities improved the access, use and management of forest ecosystems for a diverse set of actors, thus promoting mutually reinforcing environmental and social outcomes. The findings provide a rare example of MFs contribution to local sustainability and well-being outcomes from the perspectives of local actors. Also, the findings demonstrate that looking at MFs as a collective voluntary action space is helpful in revealing the mediating role of social institutions in improving the well-being benefit from ecosystem services.

In conclusion, the findings of this study have demonstrated that MFs hold the potential to design or facilitate governance arrangements that promote the effective participation and cooperation of multi-level actors from government, private sector and community to improve the governance and management of place-specific socio-ecological challenges. Model Forest attributes such as networking and leadership, multi-stakeholder and voluntary partnerships, a commitment to experiment and innovate, and share knowledge are crucial to their effectiveness. Also, the fact that MFs enjoy support and legitimacy from multiple sectors and

levels of society within specific socio-political spaces makes them important to the broader question of multi-level environmental governance. These attributes suggest ongoing policy and research attention to MFs can support better understanding and advancement of partnership arrangements for sustainable forest management.

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## DEDICATION

*To the three most precious women in my life, Beatrice Boamah, Elizabeth Koryoo Dapaah and NokoreNyame Ama Boakye-Danquah: You sacrifices enabled me reach this far.*

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| | |
|---|---|
| BO | Bridging Organization |
| CA | Capabilities Approach |
| CWG | Certification Working Group |
| EOMF | Eastern Ontario Model Forest |
| FMC | Forest Management Certification |
| FSC | Forest Stewardship Council |
| IMFN | International Model Forest Network |
| KMFA | Kyoto Model Forest Association |
| MF | Model Forests |
| MFTIP | Managed Forest Tax Plan |
| MLG | Multi-Level Governance |
| NIPFO | Non-Industrial Private Forest Owners |
| PES | Payment for Environmental Services |
| PPM | Policies and Procedures Manual |
| SFM | Sustainable Forest Management |

# CHAPTER 1: INTRODUCTION – MULTI-LEVEL ENVIRONMENTAL GOVERNANCE, BRIDGING ORGANIZATIONS, AND SUSTAINABLE FOREST MANAGEMENT

## 1.1 Background

Forests provide a diversity of products and services that benefit multiple actors at a variety of scales and levels. As a result, forest ecosystems are often susceptible not only to degradation but also to competing uses, interests and conflicts (Mwangi and Wardell, 2012; Nunan, 2018). Hence, managing forests sustainably is a complex governance process that goes beyond safeguarding ecosystem functions to include people management (Nunan, 2018). Particularly, managing multiple users with different values, goals, and degrees of power at multiple levels, scales and across space and time further increases the complexity of the governance of forests (Armitage, 2008; Mwangi and Wardell, 2012; Nunan, 2018).

Due to the complexity of governing forests as well as most renewable natural resources (Andersson and Ostrom, 2008; Poteete, 2012), the preponderance of evidence suggests that governance arrangements that work at multiple levels and scales can support effective and sustainable management (Berkes, 2002; Liesbet and Gary, 2003). Although there is no consensus on how governance at multiple levels and scales should be structured (Hooghe and Marks, 2003), generally, multi-level governance arrangements (MLG) highlight the existence of multiple actors interacting at multiple administrative levels and scales to improve the governance of natural resources (Mwangi and Wardell, 2012). MLG is defined in this context to mean governance arrangements involving interactions between and within multiple, independent jurisdictions – including different administrative levels of international, national, regional and local government – undertaking specific functions to solve a particular common resource problem (Hooghe and Marks, 2003). Over the past three decades, environmental governance scholars have recognized that governance interventions in the renewable natural resource sector have witnessed the increased role and participation of a diversity of actors operating at multiple levels (Nuna, 2018; Mwangi and Wardell, 2012; Lemos and Aggrawal, 2006). For instance, Lemos and Aggrawal, (2006) highlight a plethora of hybrid governance interventions involving diverse partnership arrangements between public, private and community actors as characterizing the field of environmental governance. Notable among these is the emergence of market type arrangements involving partnerships between private and community actors (referred to as private-social partnerships) to enhance governance for

the sustainable management of ecosystems and ecosystem services (Lemos and Agrawal, 2006; Perrot-Maitre, 2006). Examples of private-social partnership arrangements include payment for ecosystem services and certification schemes.

Various researchers have suggested that MLG arrangements, including private-social partnership arrangements, are more effective compared to traditional command-and-control measures because of their adaptability, flexibility, relatively lower cost and collaborative nature (Berkes et al., 2003; Kenny et al., 2011; Woodward et al., 2014). For instance, interactions in MLG involving cooperation and coordination between actors at any level (horizontal interactions) and flow of resources, information and decisions across levels (vertical interactions) has been noted to enhance governance effectiveness (Nunan, 2018; Mwangi and Wardell, 2012).

Despite the popularity of MLG arrangements, some scholars have pointed to several challenges that limit its potential effectiveness. First, Nunan (2018) suggests that while multi-level interactions are desirable, in practice, interactions may be intermittent, with partial coordination and cooperation between actors. Second, because of the range and diversity of actors and interests involved in MLG arrangements, the transaction cost of coordinating multiple actors could be high, thus limiting its practicability (Termeer et al., 2010). Third, MLG arrangements can face the challenge of poor accountability, legitimacy, and power asymmetries (Termeer et al., 2010; Wyborn and Bixler, 2013) since the responsibility for decision making can be masked and the sharing and exercise of power may be unequal (Nunan, 2018). Fourth, in MLG arrangements involving multiple actors, it is unclear if actors have the capability, especially the skills, resources and knowledge needed to contribute to the effectiveness of the governance process (Nunan, 2018). In this context, our understanding of how MLG arrangements can create opportunities and freedoms to improve the capabilities and the well-being of local actors is less understood. Fifth and finally, a peculiar challenge in MLG of natural resources is how to identify which governance actors are relevant and whether the governance system 'fits' with the dynamics of the underlying social system (Nunan, 2018; Brondizio et al., 2009). The lack of 'fit', which result when governance systems are not aligned to the social or biophysical systems or both, can affect the effectiveness of governance arrangements (Epstein et al., 2015). Based on the challenges highlighted above, some authors argue that the appropriateness, adequacy and effectiveness of MLG arrangements are clearly linked theoretically than proven empirically (Huijstee et al., 2007; García-López, 2013; Nunan, 2018). In these contexts, there is the need for more

empirical understanding on the opportunities for and challenges to the interactions and linkages that characterize MLG arrangements (cf. Nunan, 2018).

To enable MLG arrangements work in practice, the overwhelming consensus in the literature suggests that there is the need for strong local institutions (Berkes, 2002; Olsson et al., 2004; Andersson and Ostrom, 2008) as well as support from organizations operating at broader governance scales (Anderson, 2013), particularly to enhance cooperation and coordination at multiple levels and scales (Mwangi and Wardell, 2012). In this context, the role of bridging or intermediary organizations in facilitating MLG arrangements have been noted (Biggs et al., 2010; Mwangi and Wardell, 2012; Nunan, 2018). Crona and Parker (2012) define bridging organizations as "organizations that link diverse actors or groups through some form of strategic bridging process" (p. 32) to offer a flexible organizational concept for the governance of complex SESs (Sternlieb et al., 2013). Bridging organizations (BO) are critical in MLG arrangements because they hold potential to address the peculiar challenges that affect the effectiveness of MLG arrangements (Nunan, 2018; Mwangi and Wardell, 2012).

Despite the potential role of BOs in enhancing the effectiveness of MLG arrangements, there is a dearth of empirical work on how different BOs work in different MLG arrangements to improve resource governance and management (Hrabanski et al., 2013; García-López, 2013). Particularly, for MLG arrangements involving private-social partnership arrangements, our understanding of how BOs facilitate such arrangements and their effectiveness is limited. This is because many forms of private-social partnerships, such as market-based PES schemes, are relatively new policy tools, and thus their impacts and effectiveness, are not well understood (Bakker, 2014; Hoang et al., 2015). Particularly, research on how BOs are able to generate sufficient local capacity to enable small-scale actors to participate in and benefit from private-social partnership arrangements is limited. Examining the effectiveness of BOs in supporting local actors in MLG arrangements is important because BOs are not inherently positive. Some scholars have suggested that BOs, especially non-profit organizations, often promote technocratic professionalism and drive the interest of donors and funders relative to the interests of local actors (Hejnowicz et al., 2014; Holmes, 2011). Hejnowicz et al. (2014) also noted that concerns about the trustworthiness, credibility and capacity of BOs are considered as critical factors in evaluating their role in partnership arrangements for ecosystem management.

To improve our understanding of the role of BOs in private-social partnership arrangements, this thesis examines the effectiveness of Model Forests (MF) as BOs in facilitating the

participation of small-scale foresters in private-social partnerships for ecosystem management.

### 1.1 Model Forests as Bridging Organizations in the Sustainably Management of Small-scale Forests.

The MF concept started in Canada in 1992 with the initial establishment of 10 MFs by the government of Canada through the Canadian Forest Service (Bull and Schwab, 2005; CMFN, 2015)[1]. Currently, over 60 MFs have been adopted in more than 30 countries (NRC, 2015). Primarily, MFs are forest landscapes managed through voluntary and inclusive partnerships, dialogue, experimentation, and innovation (CMFN, 2015; NRC, 2015). However, in practice and at the international level, MFs can be understood as non-profit organizations that provide a platform and a forum to enable diverse stakeholders such as communities, forest companies, conservation agencies, markets, and government to work together to achieve sustainability in diverse forest landscapes (IMFN, 2015a). MFs, can therefore, be recognized as important governance platforms for promoting partnership arrangements involving both horizontal and vertical connections and across diverse sectors for the governance of complex forest landscapes. In this context, MFs do not only provide a platform for fostering MLG arrangements but also function as BOs that link and facilitate interactions between and among actors at different levels and scales to enhance the effectiveness of governance arrangements at the landscape level.

As a practical form of MLG arrangement, the MF approach provides many strengths. Some of these include solicitation of inputs from diverse stakeholders, provision of institutional platforms for broad public involvement in sustainable forest management (Boakye-Danquah et al., 2018), increased awareness of the importance of SFM (Ulybina, 2015), and better appreciation of less representative stakeholder values (Hvenegaard et al., 2015), such as diverse Indigenous values (Ayling, 2001). A review of the MF program in Canada by Bullock et al. (2017) suggest that MFs have helped to ‘‘define sustainability and the SFM paradigm,

[1] In 2008, the MF program was renamed the Forest Communities program with 14 MFs in the network. Also, in 2014, the federal government withdrew its funding for the program. Currently, only 4 MFs remain functional in Canada with their programs funded through independent project funding and investments in social enterprises or other forms of innovations. At the same time, an international platform for a network of MFs called the International Model Forest Network (IMFN) is growing. Both the Kyoto Model Forest Association and the Eastern Ontario Model Forest are part of the IMFN.

advance forest science and social research, and bring together a mix of usually adversarial partners in the name of innovation'' (p.156). Despite the successes, some researchers have expressed concern over the slow demonstration of results (Ayling, 2001), particularly those that can be linked to economic, ecological, social, and cultural outcomes on the ground (Elbakidze et al., 2010). In this context, our understanding of how MFs advance the well-being of local forestry actors within the broader context of MLG arrangements have yet to be addressed. Particularly, there is the need for greater understanding on how MFs can generate sufficient capacity to promote the capabilities of local actors for effective participation in MLG arrangements. Given that the conditions under which sustainability can be achieved vary spatially and temporally, examining the roles of different MFs operating in different institutional environments to improve the governance of small-scale forest landscapes can improve our understanding of how MFs contribute to the effectiveness of MLG arrangements. Thus, an exploration of MF cases across different contexts can improve empirical understanding of the effectiveness of MLG arrangements.

Small-scale forests, including Non-industrial Private Forests (NIPF) provide significant ecosystem services (Neave and Wolthausen, 2004) including ecological (e.g., fish and wildlife habitats, carbon storage, soil and water regulation), socio-economic (e.g., recreational and scenic beauty), and productive (e.g., timber and wood products) services. However, by their nature, small-scale forests are complex and difficult to govern because of their relatively small size, dispersed nature across wide landscapes, diversity of motives for their management (Fung and Conway, 2007; Fischer, Klooster, and Cirhigiri, 2018), parcelization and fragmentation, and uncertainties in ownership succession (Gruver et al., 2017). For instance, parcelization of private forests can affect forest sustainability (Gustafson & Loehle 2006), especially ecological connectivity and watershed functioning (Caron et al., 2012). Also, small-scale forest landscapes face both direct and indirect human pressures of conversion, fragmentation, and urban development (Fung & Conway, 2007). In addition, many small-scale forest communities, particularly in the post-industrial world, are caught up in complex socio-economic changes such as loss of markets for local logs, ageing of forestry workers and forest owners, low livelihood dependence on forest ecosystems and rural-urban migration (Neave and Wolthausen, 2004; Schmithu¨sen and Hirsch, 2010) – factors that limit the capabilities of local actors to manage and benefit from local ecosystems (Takeuchi et al., 2017). Furthermore, many small-scale forest owners have to contend with the management of complex ecological risks– including fire, invasive species, climate change – that often manifest at large spatial and temporal scales (Fischer, 2018). Thus, without an appropriate

governance intervention to address the challenges facing small-scale forests and forest communities, the well-being of actors and the functioning of local ecosystem services could be severely impaired. In this context, the role of MFs in convening appropriate governance arrangements that align with the underlying social conditions in small-scale forest communities as well as improve the capabilities of local actors to take advantage of the opportunities inherent in MLG arrangements to improve the governance, management and benefits from forest ecosystems deserve attention.

## 1.2 Research Purpose and Objectives

The purpose of this research is to examine the contributions and effectiveness of Model Forest organizations as BOs in convening private-social partnerships to support the sustainable management of small-scale forests. In line with this, two MF organizations, the Kyoto Model Forest Association (KMFA) in Japan, and Eastern Ontario Model Forest (EOMF) in Canada were selected as case studies.

The following objectives are defined for the research:

1) Assess the effectiveness of MFs as BOs in convening private-social partnership arrangements to improve local socio-ecological sustainability;
2) Assess the effectiveness of MFs as BOs to improve the effective participation of local actors in private-social partnership arrangements;
3) Examine how MFs can improve local dimensions of well-being through MLG arrangements;
4) Consider the implications of private-social partnerships in multi-level forest governance arrangements for the sustainable management of small-scale forests.

## 1.3 Overview of methodology

### 1.3.1 Research design

This thesis adopted a case study and a mixed-method approach. A case study research approach is useful where the boundaries between the context and phenomenon are not clearly established (Yin, 2002). As stated already, the role of MFs in the governance of small-scale forests is less understood. Hence, the selection of a dual-case involving the EOMF in Canada and the KMFA in Japan (see section 1.4 below on rationale for selection of cases) allowed for

a detailed examination of how MFs in different contexts support the sustainable governance of small-scale forest landscapes.

On the other hand, a mixed method research approach promotes the systematic collection, integration and analysis of quantitative and qualitative research including data within a single investigation (Wisdom and Creswell, 2013). The integration of qualitative and quantitative approaches is to enable a comprehensive and synergistic utilization of data compared with separate quantitative and qualitative data collection and analysis (Creswell and Plano, 2011). Moreover, a mixed-method approach provides opportunity to address complicated questions using multiple sources of evidence to enable the generation of a richer array of information (Yin, 2014).

The use of qualitative techniques helped me to answer questions such as what, how and why in relation to the role of MFs in addressing the sustainability of small-scale forests in both Japan and Canada. For instance, asking questions such as how do MFs convene private-social governance arrangements, what are the impacts of private-social governance arrangements on local forest management, and how do local actors perceive the implementation of private-social partnership arrangements, enabled me to delve deeper into the practical application of private-social partnership arrangements within specific local contexts. Since private-social partnership arrangements are relatively new policy tools to achieve sustainable forest management, the use of a qualitative approach is therefore ideal (Yin, 2014). On the other hand, the use of a quantitative approach such a survey helped to discover patterns such as how MF services are distributed, and the levels and extent of access for different groups.

## 1.4 Study context, case selection and description

### 1.4.1 Case selection

Two MF cases were selected to provide the opportunity to examine how MFs in different institutional, legal and regulatory contexts work to enhance the sustainability of small-scale forest management. The two selected cases are the EOMF in Canada and KMFA in Kyoto, Japan. The use of more than one case strengthens the rigour and reliability of a case study research (Cresswell, 2013; Yin, 2014). Both MFs have small-scale foresters as their primary stakeholders. In addition, each MF has adopted and implemented a private-social partnership arrangement to enhance the governance of small-scale forests. Moreover, both MFs are relatively long-standing (more than 10 years) and so they are well developed and have a considerable history of engagement with local actors to promote sustainability. Despite these

similarities, both cases differ in terms of geographical location (Japan and Canada), the socio-ecological challenge (see section 1.2.3), cultural differences and the specific governance tools used to address the challenge (see section 1.2.3). Thus, both cases provided opportunities to identify patterns of difference or similarity to enhance knowledge sharing. In effect, the use of two comparable cases enabled me to examine: (1) how MF organizations in Canada and Japan work to address local-level forest sustainability challenges; (2) the tools used by MF organizations in different contexts to deliver the goals of Sustainable Forest Management (SFM); and (3) the local perceptions of small-scale forest actors on the effectiveness of governance tools used by MFs to address local forest management concerns. The two cases are described below.

### 1.4.2 Study context and case description

#### *1.4.2.1 Eastern Ontario Model Forest, Canada*

The Eastern Ontario Model Forest (EOMF), established in 1992, is a not-for-profit, charitable organization. Located in the Great Lakes-St. Lawrence Forest Region of Canada, the EOMF works with government, landowners, industry, First Nations, non-governmental organizations and others to develop new ways to sustain and manage forests (EOMF, 2015a). The EOMF extends over an area of 1.5 million hectares, and about 34 percent of the land base is forested (EOMF, 2015a).

Over 90 percent of forests in Eastern Ontario are owned privately and range from 10 to 100 hectares. Communities in the region continue to rely on the forest for traditional economic benefits such as forest products, maple syrup production, and recreational activities (EOMF, 2015a). The main socio-ecological challenge facing small-scale foresters include: ageing forestry workers and owners, lack of technical knowledge and skills to implement forest management and operations, such as the management of invasive and species at risk, and limited local market access for logs (EOMF, 2015a). Also, reaching out to educate and provide information on best management practices to landowners is problematic due to their scattered locations (EOMF, 2015a).

In 2003, the EOMF began a Forest Management Certification (FMC) program as a governance tool to support the sustainable management of private woodlot in southwestern and eastern Ontario (EOMF, 2015b). The FMC program started with 1,700 hectares in 2003 and by March 2015, this had grown to over 83,650 hectares (EOMF, 2015b). Under the program, EMOF acts as a bridge or intermediary between the Forest Stewardship Council

(FSC) and private landowners to enable them to access certification. The certification program also includes community forests and private commercial forest participants. Thus, the FMC program brings diverse forest actors together in pursuit of responsible forest management under a common framework for forest management with guidance, support and leadership from EOMF. As an intermediary, the EOMF holds and manages a Five-Year renewable FSC certificate. The program also requires a yearly audit conducted by independent auditors and facilitated by the EOMF. Under the agreement, the audits are often conducted on forest properties with active operations. Under the terms of the certificate, forest owners, must adhere to three basic requirements for inclusion in the EOMF certificate: must have a forest management plan; must sign a Memorandum of Understanding with the EOMF; and must pay an annual contribution fee based on an ownership matrix.

The FMC program is managed by a Certification Working Group that has representation from the EOMF, the private landowners, maple syrup producing industry, community forests and government. The Certification Working Group provides oversight technical and managerial support to the coordinator who makes the day to day decisions regarding the forest management certification program.

#### *1.4.2.2 Kyoto Model Forest in Japan*

The Kyoto Model Forest Association (KMFA) was established in 2006 by the Kyoto Prefectural Government. Currently, the KMFA operates as a non-governmental organization. The KMFA is made up of a collection of small detached private or communal forests all over Kyoto, each with its own management approach but united under the Model Forest banner (IMFN, 2015b). There are about 13,000 private forest owners and 26 local governments within the KMFA operating region.

The major socio-ecological challenge facing forest governance in Kyoto and throughout Japan is the neglect and underuse of forests largely because of the decline in the domestic timber industry, rural outmigration, lack of interests by owners, and reduced dependence on natural resources (Takeuchi et al., 2017). Since the majority of forests in Japan are plantations, which require periodic management, the neglect and abandonment of forests represent a major management and governance challenge (Iwai, 2002). Particularly, the lack of forest management results in poor forest ecosystem functioning such as reduction in the capacity of forests to provide environmental functions such as erosion, flood and landslide

control, and underground water recharge, and loss of habitat diversity (Okada, 1999; Iwai, 2002; Yashiro et al., 2013).

To address the above socio-ecological challenges, forest governance in Japan now recognizes public participation through collaborative forest management activities (Iwai, 2002). In Kyoto, the KMFA encouraged collaborative forest management activities through the mobilization of external actors from urban areas and private non-forest firms to support the management of abandoned forests in rural villages. In Kyoto, private sector actors from diverse sectors such as banking and insurance, food and beverages, electronics and energy participate in the KMFAs forest management program. These private organizations consider their participation in the KMFA's forest management program as part of their Corporate Social Responsibility (CSR) (IMFN, 2015b). Currently, there are 41 private companies and more than 70 local organizations that voluntarily participate in KMF activities with the support of municipal governments. Under these collaborative arrangements, private companies enter into 5-year agreements with the KMFA through which they conduct forest conservation activities such as thinning, weeding, bamboo management, trail construction and environmental education. In return, the KMFA offers incentives to their employees in the form of recreational opportunities in the forest (Shingo, 2017).

## 1.5 Data collection methods

In line with the mixed method approach adopted in this thesis, data collection involved the combination of qualitative and quantitative strategies. These strategies included interviews, surveys, document review, and field observations as described below. For the field data collection, I visited Kyoto between January and March 2016 and also visited Eastern Ontario between July and August 2016.

### 1.5.1 Semi-structured interviews

Semi-structured interviews were conducted with selected participants in each of the MFs in both study locations. Tables 1.1 and 1.2 show the categories of participants selected for the interviews in the EOMF and KMFA respectively. In Japan, the majority of interview participants were representatives of groups involved in forest management from community associations, private corporations and local governments. On the other hand, in Canada, the majority of the interview participants were mostly forest owners themselves who make decisions regarding their forest. Generally, the interviews sought to understand the history of

participant's involvement with the MFs as well as their experiences, challenges and future expectations. See Appendix H for the interview protocols used.

In Eastern Ontario, four categories of participants were interviewed (Table 1.1). The first group were certified landowners. Participants were randomly selected from a contact list of members belonging to the certification program and by referrals by other members interviewed. Participants were contacted through a phone and email to arrange the interview. After a participant contacted had agreed to participate in the study, a suitable time is arranged for the interview either through phone or in person depending on the preference by the landowner. In the interviews, the landowners were asked questions on their involvement in the certification program in terms of history, motivation, experiences, benefits, challenges and future involvement. The second landowner group interviewed were non-certified woodlot owners. Although the focus of the thesis was on certified landowners, the involvement of uncertified landowners was to understand their reasons for not participating. The majority of the interviews with the landowners were conducted via phone because they were scattered throughout eastern Ontario, making it was difficult to reach them physically. The number of landowners interviewed was influenced by the willingness of participants contacted to participate in the study and the saturation point reached during the interviews. The third group of participants interviewed were forest managers who were members of the Certification Working Group. These interviews sought to understand the workings of the group relative to their roles, accomplishments, and challenges. The fourth and final group of participants interviewed were managers of the EOMF. This group included the manager of the EOMF, the coordinator of the certification program and two provincial government employees affiliated with the certification program. The interviews focused on the history of the design and implementation of the certification program, its major accomplishments, challenges and future prospects.

Table 1.1 Description of interview participants in Eastern Ontario Model Forest

| **Category of interview participants** | **Number interviewed** | **Place interviewed** |
|---|---|---|
| Staff of model forest | 4 | Premises of the EOMF |
| Forest Managers in the Certification Working Group | 6 | In person, and on the property of the interviewee, and via phone |

| | | |
|---|---|---|
| Certified woodlot owners | 18 | In person and via phone |
| Non-certified woodlot owners | 4 | In person and on the property of the interviewee and via phone |
| Representatives of local forestry groups | 2 | |
| Total | 34 | |

In Japan, four categories of participants were interviewed (Table 2). The first category of participant was representatives of private corporations involved in local forest management. Second, heads of local forest conservation associations (forest and citizen volunteers) were interviewed. Third, forestry officials with the Kyoto City were also interviewed. In all the interviews, participants were asked questions on their motivation in local forest management, relationship with the KMFA and other stakeholders, activities undertaken, challenges they face, and future expectations. The fourth and final category of participant interviewed was staff of the KMFA including the general manager and the president. Both interviews focused on the functions of the KMFA relative to its forest management program and the relationship it maintains with stakeholders.

In Kyoto, two group interviews were also conducted with two forest volunteer groups. In these interviews, when a question was posed, each participant provided a response to the question until the next question was asked. However, participants were free to interrupt to agree, or disagree to the comment by the other. The first group meeting was organized with 12 male participants from the Nagaoka city. The meeting took place on a forest site and during the group's regular management activity. Except for one person who was introduced as the leader, the rest were regular members. In the second meeting, 5 male participants (3 leaders of different volunteer groups and 2 members of one volunteer group) attended from the Nishiyama area. Participants in the group interviews had between 5 and more than 10 years of volunteer experience. The group interviews afforded me the opportunity to understand the activities of the group, their motivations, and relationship with the KMFA and other stakeholders.

All interviews, except with the model forest staff, were conducted in Japanese with the help of an interpreter.

Table 1.2 Description of individual interviews conducted in the Kyoto

| **Status** | **Number interviewed** | **Place interviewed** |
|---|---|---|
| Staff of Model Forest | 2 | Office of the KMFA |
| Forestry officials with the Kyoto City | 2 | Premises of a community Centre in Nagaokakyo City |
| Representatives of non-forest Private corporations | 5 | Managed forest site, Office of the KMFA or company |
| Head of local forestry association | 5 | Managed forest site (3), email (2) |
| Total | 14 | |

### 1.5.2 Surveys

In both cases, questionnaire surveys were conducted to derive primarily quantitative data on the perceptions, experiences and expectations of local forest actors involved in each of the MFs program of interest. See Appendix H for survey questions used in Kyoto and the Eastern Ontario respectively. In both sites, the surveys were conducted after the completion of the field interviews.

In Japan, the instruments for collecting the survey data included online (google forms), email (word attachment) and mail. The use of different survey instruments helped me to reach out to different participants of the KMFA. The questionnaire was translated into Japanese and pretested before being administered. In total, the survey was sent to 148 respondents including private companies (41), forest activity or volunteer groups (80), and local governments (27). A total of 41 completed questionnaires were received at the close of the survey for a response rate of 28 percent. Respondents had three weeks to submit their completed responses. However, additional two weeks were added were added to encourage more participation. Appendix A (Table A.1) shows the socio-demographic characteristics of respondents who responded to the survey.

In Canada, participants for the survey were drawn from all stakeholders involved in the forest certification program including woodlot owners, forest managers and members of the certification working group. The survey was sent to160 participants including 90 currently certified forest owners, 29 members of the certification working group and 41 inactive or former certified woodlot owners. At the end of the survey, 66 completed responses were received which translate into a response rate of 41.3 percent. Participants had three months

(August – October 2016) within which to respond to the survey. Three rounds of reminders were sent to the participants within this period to enable more participants to submit their responses. Appendix A shows the demographic characteristics of the all survey participants and members of the certification program respectively.

### 1.5.3 Document review

In both cases, secondary information relating to the functional and organizational operations and outcomes of each of the MFs were reviewed. Appendix B.1 and B.2 shows the specific documents reviewed and the sources for both cases. In Japan, secondary information on the report of forest management activities undertaken by private corporations and local groups spanning a period of 10 years was reviewed. The reports which were in Japanese language were translated into to English. Appendix G (Table G.1) shows a summary report of the forest management review. The summary provides information on the types of forest management activities undertaken by participants, reported outcomes, and challenges encountered.

Regarding the EOMF, the public summary of the annual audit of the certification program from 2004 – 2016 and the organizational, operational and historical profile of the EOMF Certification Program were reviewed. Appendix G (Table G.2) shows a summary report of the FMC audit review. The summary highlights specific themes of interest such as: changes to forest health and forest management practices, stakeholder concerns, internal or administrative management issues, forms of collaboration, and training and capacity development.

### 1.5.4 Field observations

At both sites, I had the opportunity to observe forest landscapes. All observations on the field were entered into a field note book. In eastern Ontario, I visited four certified woodlots. At two of these field observations, the landowners personally invited and took me around their forests. In the remaining two observations, I went with the coordinator of the FMC program to some of forest properties under the certification program. In addition to these, I also visited two community certified forests. During these field observations, I engaged in informal discussion with the owners or managers where possible. Some of the participants also showed me sensitive parts of their forests such as brooks, specific bird or animal habitats, invasive plants, and peculiar tree species (based on size, density on the landscape, and age).

In Kyoto, I took part in four field forest observations (Appendix B, Table B.3). At two of these events, I participated in a forest management activity with two groups – one, a private company and the other, a forest volunteer group. The activities involved thinning, fire wood harvesting, grass-cutting, and mushroom harvesting. At the third event, I travelled in the company of a forest volunteer group from the *Nishiyama* area on a field observation trip sponsored by the Kyoto government. On this field trip, I observed how local forestry groups utilize forest products, particularly for charcoal and firewood. I also observed a training session on bamboo management, natural forest regeneration practices and deer damage protection methods for plantation forests. At the last event, I toured a forest owned by a shrine in Kyoto. On this field visit, I learned some of the common tree species in Kyoto and observed a newly thinned forest. In addition to these field observations, I also attended the annual model forest conference organized by the KMFA and participated in a bamboo forest management training workshop for potential new forest volunteers. I also attended a lecture on mountain forest management organized by a private non-forest company which is a member of the KMFA. Appendix B, Table B.3) provides the dates and further description of these activities.

In March 2017, I visited Kyoto for a second time. On this trip, I joined a forest observation field trip with students of an environmental governance program from the Sophia University which is a member of the KMFA. I observed how a bamboo forest is managed, some of the forest management activities by private companies to keep forest healthy, and facilities provided by local governments and private companies to enhance public access to forest. I also provided preliminary results to some of the KMFA participants and also interacted with local government forestry staff and an official of the KMF.

### 1.5 Data analysis

Except in two instances where permission was not granted, all the interviews were audiotaped and transcribed verbatim. The transcribed interviews together with the field notes were coded and analysed by theme using NVIVO 11, a qualitative data analysis software program. I personally generated the codes through a three-step iterative process. First, I used the 'frequently used words' function in NVIVO to identify the most common words that emerged from the interviews. Some of the words that emerged from the frequently used words list formed the initial higher-level codes or themes. Second, guided by specific objectives of the research and concepts informing the study, additional themes were selected or coded. Some of

the results from the frequently used word list were consistent with this second level coding. Third, additional themes of significance emerged from the interviews in the process of coding. These three steps were combined to arrive at the final themes/codes for the study.

In analysing the interviews of individual participants, themes were organized to determine participant experiences – both positive and negative – and their relationship with the MFs. For the group interviews, common themes of agreement or disagreement expressed by participants were coded to represent the group's views. Individual participant's views of interest were also coded and attributed to the individual within the group.

The analysis of program documents focused on identifying specific historical information to corroborate or fill in gaps from the views expressed by participants. Also, the survey data was analysed using the Statistical Package for the Social Sciences (SPSS) software. The survey data was originally stored in Microsoft excel and later imported into SPSS. Simple descriptive statistics from the survey data were derived and presented in graphs and tables to compliment the interviews and document review.

### 1.6 Practical Contributions of the Research

At the international level, the use of private-social partnership arrangements to enhance the effective governance and management of renewable natural resources including forests is gaining attention. However, many forms of private-social partnership arrangements remain relatively new, and therefore, less understood (Bakker, 2014; Hoang et al., 2015). For instance, in Japan, although evidence from the literature suggests that private non-forest corporations are partnering with local communities to conserve ecosystem services in rural villages, knowledge on the institutional arrangements facilitating such programs are less known (Takeuchi et al., 2017). Similarly, in Canada, while forest certification has been widely adopted on publicly owned large-scale forests to advance sustainable forest management, the uptake of forest certification among small-scale forest operators is only beginning to emerge. Hence, there is limited understanding about the institutional arrangements facilitating or inhibiting private-social partnership's effectiveness as well as its local level impacts. The findings of this thesis, therefore, contributes to fill an important knowledge gap about the opportunities, constraints and outcomes of private-social partnership arrangements in both Canada and Japan. Thus, local communities, facilitating organizations and promoters of private-social partnership arrangements can draw on the findings of this

research to improve their understanding of the potential opportunities, constraints and outcomes relative to their objectives and goals for forest management.

Also, the findings of this work can help improve relationships between MF organizations and its stakeholders. Despite the increasing popularity of the MF concept, some advocates have expressed worry over the lack of clear progress and results on the ground (see Ayling, 2001; Elbakidze et al., 2010). Most studies on MFs tend to focus on the organizational or governance design, structure and operations of MFs relative to local-level outcomes revealed by representative stakeholders (Boakye-Danquah et al., 2018). Without tangible benefits for MF stakeholders including funders and promoters, the commitment of partners may decline, and MF managers may suffer from a legitimacy crisis. This research highlights the novel ways through which MFs build local adaptive capacity and enhance local institutional arrangements for improving social and ecological outcomes that synergistically benefits people and ecosystems (see Chapter 4). The focus of this thesis on local-level impacts of MF initiatives demonstrate progress and can help improve the relationship between MFs and its stakeholders. Thus, this thesis makes an important contribution to support the practicality of the MF approach to address local sustainability challenges.

Moreover, the findings of this thesis (see Chapter 2) demonstrates how MFs BOs design or facilitate the revitalization of underutilized rural forest landscapes to improve the relationship between people and ecosystems. Although the literature has suggested that BOs are ideal to facilitate the transformation of underutilized landscapes (see Fischer et al., 2012; Takeuchi et al., 2016), empirical studies are non-existent. Thus, the findings of this study, which provides a practical demonstration of how BOs work to transform underutilized rural forest landscapes, can guide the work of conservation agencies working in countries where the underutilization of forestry and agriculture landscapes present a daunting governance and management challenge.

Finally, the focus of this research on MFs from Canada and Japan presents interesting perspectives for learning and knowledge exchange which is important to the MF concept. The International Model Forest Network (IMFN) represents a network of regional MF associations that fosters ‘international exchange of ideas and solutions for the sustainable management of natural resources in forested landscapes’ (IMFN, 2018). This thesis presents one of the first intercontinental comparison of MF initiatives. Thus, the illustrative examples from the two MF cases presented in this thesis can contribute to learning and knowledge exchange across the MF network. Although the socio-ecological challenge addressed by each

of the MFs are different, both cases present a unique understanding on how MFs can work to improve small-scale forest governance.

### 1.7 Ensuring Reliability and Validity of Research

Reliability in research refers to 'the extent to which research findings can be replicated' (Merriam and Tisdell, 2016, p. 250) while validity or credibility refers to the truthfulness of research findings (Mansvelt and Berg, 2005). In this research, three main strategies were used to enhance the reliability and validity of the findings.

First, a case study research approach is often criticized for its lack of rigour and inability to provide sufficient basis for generalization (Creswell, 2013; Yin, 2014). In this thesis, this inherent weakness in the use of a case study was addressed using two cases and multiple sources of evidence or data collection techniques (Yin, 2014). For example, I used qualitative and quantitative strategies to provide distinctive kinds of evidence (Ritchie, 2009). For instance, the qualitative techniques helped me answer questions such as what, how and why in relation to the role of MFs in promoting the sustainability of small-scale forests in both Japan and Canada. Since research on how private-social partnership arrangements benefit small-scale foresters in both Japan and Canada are still developing, the use of a qualitative approach was ideal to discover a richer understanding of the issues (Yin, 2014). Specifically, by drawing on individual and group interviews, observations and document review, I derived a rich and nuanced understanding of the role of the MFs in each case. On the other hand, the use of a quantitative approach (e.g., surveys) helped me to discover patterns such as who benefits from MF services and the levels of satisfaction with the services provided by the MFs. Each of these diverse knowledge sources provided additional evidence to confirm the other, thus increasing confidence in the findings. Thus, the use of multiple sources of evidence through data triangulation enhanced the credibility of my research findings.

Moreover, the use of two cases instead of a single case increased the reliability of the findings. The two cases allowed me to analyse data both within each case and across cases (Yin, 2003). Analysing more than one case enabled me to compare contrasting findings and to also augment similar findings from both cases. The comparison of cases provided an important contribution to the literature since the evidence can be considered strong and reliable (Baxter and Jack, 2008). Also, the findings from the two cases allowed broader exploration of research questions and conceptual improvement (Eisenhardt and Graebner, 2007), particularly on the dynamics of small-scale forests in the post-industrial north and the

contribution of the MF concept to the broader question of environmental governance (see section 5.4). Thus, the use of two cases increased the validity of the findings.

Second, I took important steps to build rapport and trust with my research participants. I believe that building good rapport with the research participants enabled the participants to freely discuss with me their experiences and perceptions. Before going into the field, I spent several months in discussion with both host MF organizations. I discussed with them the purpose of my research and how it can benefit them. After receiving the support of both MFs to undertake the research, I was given the opportunity to introduce myself to the participants. I provided a brief introduction about myself, my research objectives and the benefit of my research to the MF organizations. This information was shared with the participants through both a newsletter (in the KMFA) and email (in the EOMF). Also, in both sites I participated in several field observations, events and programs, before my interviews. These activities increased my visibility and enabled me to gain the trust of my participants. Moreover, some of the questions I asked during the interviews were based on things that I had personally observed. Participating in field activities was essential to ensuring data quality since I could relate my questions to some of the forest management activities that I had reviewed and observed before the interviews.

Third and finally, I undertook some of the document review and field observations before conducting the interviews and surveys. By doing this, I was able to compare and validate the information that emerged from the document review with the interviews and surveys. Also, I had the opportunity to return to the community - in the case of Kyoto – to present preliminary results and solicit feedback. These processes improved the genuineness of the research findings as the data were confirmed at multiple levels.

### 1.8 Thesis Structure

This thesis is presented as a "manuscript-type dissertation", comprised of three manuscripts (Chapters 2, 3, and 4) as required by the College of Graduate and Postdoctoral Studies. It contains five chapters, including a general introduction (Chapter 1) and a general conclusion (Chapter 5). These introductory and concluding chapters bookend the three manuscripts. I am the lead author of all the manuscripts. As the lead author, I collected the data, performed the analysis, and took a leading role in designing and writing all the manuscripts. The appropriate citations of the manuscripts are as follows:

- Boakye-Danquah, J., Reed, M. G., Robson, J. P., and Sato, T. (2018). A problem of social fit? Assessing the role of bridging organizations in the recoupling of socio-ecological systems. *Journal of Environmental Management*, 223, 338-347.
- Boakye-Danquah, J., and Reed, M.G. (accepted). The participation of non-industrial private forest owners in forest certification programs: the role and effectiveness of intermediary organizations. Accepted for publication in the journal of *Forest Policy and Economics*
- Boakye-Danquah J., and Reed, M.G., (submitted). Linking forest values, ecosystem services and human well-being through a capabilities approach – evidence from Model Forests in Japan and Canada. Submitted to *Landscape and Urban Planning.*

The first manuscript (Chapter 2), entitled ‘‘*A problem of social fit? Assessing the role of bridging organizations in the recoupling of socio-ecological systems*’’ examines the role of BOs in transforming underutilized rural forest landscapes to enhance human-ecosystem relationships. Using the concept of social fit – how institutional arrangements address contextual social conditions to enhance governance effectiveness – this chapter examines the work of the KMFA, a BO, in improving the relationship between forests and people in Kyoto, Japan. This chapter employs a mixed method approach involving a questionnaire survey, document review, semi-structured interviews, and field observations to examine the governance mechanisms used by the KMFA to enhance social fit. The findings from the chapter revealed that the KMFA used several bridging functions to enhance social fit, and thereby improve forest-people interdependence. Specifically, some of the key bridging functions were: investments in places and systems to reduce participation costs; building trust and reducing value mismatches; provision of incentives and improvement in management capacity; provision of leadership to diverse local forestry groups; facilitation of institutional integration of forest and non-forest organizations; and drawing resources from diverse organizations. Collectively, these roles improved human-ecosystem interdependence by broadening the participation of different actors with novel connections to local ecosystems, enhancing local self-organizing capacities, and streamlining the roles of forest management institutions. In essence, this chapter provided evidence of the efficacy of BOs to recouple human-ecosystem relationships and improve governance outcomes in underutilized social-ecological systems.

The second manuscript (Chapter 3) is entitled '' *The participation of non-industrial private forest owners in forest certification programs: the role and effectiveness of intermediary organizations*'' examines the role and effectiveness of intermediary organizations in enhancing the participation of Non-Industrial Private Forest Owners (NIPFOs) in a market-based ecosystem governance arrangement, specifically forest certification. The chapter focuses on the Eastern Ontario Model Forest (EOMF), in Canada, which facilitates the participation of NIPFO in the Forest Stewardship Council's (FSC) group forest management certification program. Drawing on the broader literature on intermediary roles in market-based payment for environmental services, this chapter defined the concept of intermediary effectiveness to mean the capacity of an intermediary organization to address the challenges that limit the participation of NIPFOs in certification, improve the benefits of certification for NIPFOs, and contribute to improve local conservation efforts. This chapter employs a mixed method approach including interviews with landowners and forest managers, document review and surveys to examine the role of the EOMF in the design and implementation of a group forest management certification program. The findings of the chapter highlighted that the role of the EOMF in the certification of NIPFOs can be grouped under three broad categories and program implementation phases which includes: program design and implementation (early-phase), routine administrative and organizational work (take-off phase), and organizational and financial sustainability (long-term phase). The chapter further revealed that across the different phases of the certification program, the key attributes that enabled the EOMF to perform effectively were its capacity to build and leverage on its social capital, provide locally relevant professional forestry services required by the landowners, operate at a relatively low cost, and adapt and innovate to respond to program changes and stakeholder demands. The findings of the chapter are helpful to understanding how intermediaries facilitate landowner participation in certification systems and as well optimize certification to better respond to local actor's socio-ecological needs and interests.

The third manuscript (Chapter 4) is entitled '*Linking forest values, ecosystem services and human well-being through a capabilities approach – evidence from Model Forests in Japan and Canada*'. This chapter illustrates how MF initiatives in different socio-ecological landscapes and institutional settings generate capabilities to improve the well-being of small-scale forest actors. Drawing on the Capability Approach (CA), the chapter re-conceptualized the Model Forest (MF) as a forum for the generation of collective capabilities that help create opportunities and freedoms to improve local ecosystem management capacity and the well-being of small-scale forest actors. Focusing on small-scale forest actors in the EOMF in

Ontario, Canada and the KMFA in Kyoto, Japan, the chapter highlights the forest values prioritized by forest actors and the capabilities required to enable the actors to achieve those values. To enable actors to pursue the values they have reason for, the chapter showed that membership of the MFs enabled the participants to draw on diverse capability sets to improve their functionings. These include livelihoods and activities; knowledge and technology; relationships building and coordination; and freedom and voice. Collectively, these capabilities improved the functioning of the actors, particularly to pursue shared values for forest management and conservation and to improve local ecosystem benefits from the forest. The findings of the chapter demonstrate that a CA analysis focusing on collective capabilities is helpful in envisioning an effective governance arrangement that can respond to the peculiar challenges in small-scale forest communities, particularly in post-industrial rural forest settings.

In the concluding chapter, I highlight the main lessons learned from the two case studies and consider its broad implications to the field of multi-level environmental governance and the role of BOs. I also suggest policy contributions and provide leads for future research.

## PREFACE TO CHAPTER 2 – A PROBLEM OF SOCIAL FIT? ASSESSING THE ROLE OF BRIDGING ORGANIZATIONS IN THE RECOUPLING OF SOCIO-ECOLOGICAL SYSTEMS

Chapter 2 examines bridging functions that improve human-ecosystem relationships in decoupled social and ecological landscapes. Specifically, the chapter focuses on how the KMFA promotes human-ecosystem relationships in the underutilized forest landscapes of Japan. This chapter draws on the concept of social fit to enhance empirical understanding of how transformation strategies involving recoupling of human-ecosystem relationships work in practice. Social fit suggests that the effectiveness of institutions depend on how well governance arrangements align with the interests, values, beliefs, and expectations of resource actors (Epstein et al., 2015). In this context, the chapter examines how the KMFAs governance arrangements enhance social fit and the implications for generating new and innovative linkages between the people and forests in Kyoto, Japan. The chapter revealed that to improve social-fit, the KMFA prioritized the provision of public education on the effect of forest underutilization; invested in places and systems to reduce participation costs; built trust and reduced value mismatches; provided incentives and built management capacity; provided leadership to diverse local forestry groups; facilitated institutional integration of forest and non-forest organizations; and drew resources from diverse organizations. For instance, the provision of investments in places and systems reduced the transaction cost of participation in ecosystem management and broadened the participation of different actors with novel and genuine connections to local ecosystems. Also, the integration of actors from government, the private sector, and local communities enabled the KMFA to mobilize diverse resources, personnel and knowledge to improve ecosystem management. Yet, the findings also highlighted that different stakeholders have different levels of satisfaction relative to the roles of the KMFA. The implications of these findings suggest that while BOs such as the KMFA are effective in fostering the transformation of underutilized forest landscapes, transformation strategies tend to be complex and dynamic. Hence, the chapter suggests the need for a broader understanding of the contextual factors that condition the success of transformation initiatives in underutilized landscapes.

# CHAPTER 2 – A PROBLEM OF SOCIAL FIT? ASSESSING THE ROLE OF BRIDGING ORGANIZATIONS IN THE RECOUPLING OF SOCIO-ECOLOGICAL SYSTEMS


## Abstract

The decoupling of human-ecosystem relationships in underutilized forested or agricultural regions poses a threat to cultural and biological diversities. Some scholars have proposed transformative strategies involving actors from multiple levels and sectors supporting local-led efforts to reconnect social and ecological systems with the support of bridging organizations (BOs). However, empirically-based understandings about how and under what conditions BOs can address context-specific social conditions to enable transformation work remain limited. Using the concept of social fit – how institutional arrangements address contextual social conditions to enhance governance effectiveness – this study examines the work of the Kyoto Model Forest Association (KMFA), a BO, in improving the relationship between forests and people in Kyoto, Japan. We employed a mixed method approach involving a questionnaire survey, document review, semi-structured interviews, and direct observations. Our findings showed that to improve human-ecosystem interdependence, the KMFA prioritized the provision of public education; invested in places and systems to reduce participation costs; built trust and reduced value mismatches; provided incentives and built management capacity; provided leadership to diverse local forestry groups; facilitated institutional integration of forest and non-forest organizations; and drew resources from diverse organizations. These roles broadened the participation of different actors with novel connections to local ecosystems, enhanced self-organizing capacities, and streamlined the roles of forest management institutions. To sustain these efforts, the KMFA needs to continuously adapt to meet the needs and perceptions of diverse and dynamic actors and to broaden participation. Our analysis provides evidence of the efficacy of BOs to recouple human-ecosystem relationships and improve governance outcomes in underutilized social-ecological systems.

## 2.1 Introduction

In some regions of the world, the underutilization of rural forested or farming landscapes, combined with changes in industrial structures and increased external dependence on agricultural and energy products, has led to a decoupling of human-ecosystem interactions and relationships (Fischer, Hartel, and Kuemmerle, 2012; Berge and McKean, 2015; Shimada, 2015; Takeuchi, Ichikawa, and Elmqvist, 2016). Examples of systems undergoing such changes include *milpa* cropping-systems in Mesoamerica (Robson and Berkes, 2011a), semi-natural grasslands in Europe (Hartel et al., 2016), and the *Satoyama*[2] landscapes of Japan (Takeuchi et al., 2016). These systems are examples where local people, who have historically relied on ecosystems for livelihood and well-being, have reduced their utilization and consequent benefits for both people and nature. Also, in Japan, evidence is widespread that reduced human activities in coastal areas are causing deteriorations in biocultural diversity and diverse ecosystem functions and services of *Satoumi*[3] (Yanagi, 2012). The decoupling of such relationships at the local level poses a threat to biocultural diversities that are built on the interdependencies between people and nature (Queiroz, Beilin, Folke, and Lindborg, 2014). Decoupling also reduces the benefits people derive from these systems for sustainable use (Dorresteijn, Hanspach, and Fischer, 2015). Accompanied by a weakening of local social capacities (Robson and Berkes, 2011b; Fischer et al., 2012), the decoupling process brings to the fore issues of social fit, or how the institutions that govern landscape use and management reflect the underlying (and dynamic) social conditions (Olsson, Folke, Galaz, Hahn, and Schultz, 2007; Epstein et al., 2015). The concept of social fit draws attention to the need to match environmental institutions to their social context and the problems they are meant to address (DeCaro and Stokes, 2013). Thus, good social fit should enhance management effectiveness and improve the sustainability of social-ecological systems (SESs) (Treml, Fidelman, Kininmonth, Ekstrom, and Bodin, 2015).

To enhance the sustainability of underutilized landscapes, some scholars have suggested alternative ways to frame and implement their management; namely, to move away from efforts that preserve or protect traditional landscape characteristics, to ones that seek to transform or revitalize resource use (see Fischer et al., 2012; Takeuchi et al., 2016). Compared to a preservation or protection strategy, a transformation strategy seeks to protect

[2] *Satoyama* landscapes comprise a mosaic of different ecosystem types including secondary forests, agricultural lands, irrigation ponds and grasslands, along with human settlements which have been managed to produce bundles of ecosystem services (Takeuchi et al., 2016).

[3] *Satoumi* refers to coastal landscapes with high biological productivity and high biodiversity due to harmonized human activities (Yanagi, 2012).

and conserve ecosystems by supporting local-led efforts to create novel, direct long-term links between social and ecological systems (Fischer et al., 2012; Takeuchi et al., 2016). In Japan, such thinking is akin to broader *Satoyama* and *Satoumi* management strategies involving the creation of new forms of relationships between people and ecosystems as a culturally appropriate ways to support the management and promote sustainable ecosystem use (Yanagi, 2012). Where this has taken place, non-governmental organizations (NGOs) and local governments can play a vital supporting role. In Japan, Takeuchi et al. (2015) explain how NGOs and local governments often facilitate private-social partnership arrangements involving private corporations providing funding and volunteer labour in support of local-led efforts to support woodland management.

Human nature connections are complex involving multiple values such as 'material (e.g. resource extraction), experiential (e.g. activities), cognitive (e.g. attitudes, values), emotional (e.g. fear, joy) and philosophical (e.g. ontological frameworks) (Ives et al. 2017, 106). Often, transformation processes go beyond the local to include multi-level actors and institutions (Fischer et al., 2012; Takeuchi et al., 2016), thus requiring governance arrangements to integrate a plurality of interests, opinions, and values with regard to human-nature connections at different scales (Hobbs, 2009; Duraiappah et al., 2014). While some scholars have contributed to the theoretical and conceptual framings of such transformation strategies, our empirically-based understanding remain limited (Fischer et al., 2012; Takeuchi et al., 2016). For example, little is known about how, and under what conditions, NGOs can address context-specific social conditions in underutilized landscapes to enable recoupling of human-ecosystem relationships. In Japan, landscape services and benefits (e.g., experiential and cognitive services) enjoyed by outsiders can contrast markedly with the values and benefits (e.g., resource extraction including firewood and wildlife) perceived by local communities (Berge and McKean, 2015). The subsequent layering and interplay of human-nature connections not only makes governance arrangements more convoluted but increases the potential for mismatches to arise (Duraiappah et al., 2014). Thus, as multi-level institutions and actors increasingly shape decisions regarding the management and utilization of underutilized local landscapes, we need to understand how NGOs can work as bridging organizations (BOs) to facilitate and sustain these processes.

This paper examines how BOs might fit governance arrangements to the complex governance challenges and social conditions characteristic of underutilized landscapes. It then discusses the implications that alignment holds for improving human-ecosystem relationships in such settings. We draw on empirical research conducted in Japan, specifically focusing on the role

of the Kyoto *Model Forest*[4] Association (KMFA), as a BO that is looking to improve forest-people relationships through the engagement of multi-level actors and institutions. By examining the work of the KMFA through the lens of social fit, we elucidate how engagement with multi-level actors can provide a pathway to recouple people-forest relationships and enhance management outcomes. Specifically, we examine how KMFA's governance arrangments align with the culture and values of groups and also satisfies the needs and expectations of actors at different levels of social organization.

### 2.2 Linking Understandings of Social fit and Bridging Organizations

The concept of social fit has roots in theories of democratic decentralization and polycentric governance (DeCaro and Stokes, 2013; Meek, 2013; Epstein et al., 2015). Social fit suggests that the effectiveness of institutions depends on how well governance arrangements align with the interests, values, beliefs, and expectations of resource actors (Meek, 2013; Epstein et al., 2015). Social fit has been examined differently in diverse resource governance contexts. DeCaro and Stokes (2013) used institutional acceptance – how much individuals endorse a system of governance – as a measure of social fit. According to the authors, public participation that support a sense of procedural justice and self-determination among participants can improve social fit. In Alaska, Meek (2013) used the extent to which public policy reflects local constructions of legitimacy, such as congruence between informal and formal formal networks of whale harvesting to measure social fit. Practices that promote social fit can enhance intrinsic motivation (DeCaro and Stokes, 2013) and provide legitimacy (Green, Schultz, Nekoro, and Garmestani, 2015) for the design and implementation of environmental decisions while reducing the likelihood of negative impacts (Berdej and Armitage, 2016). Negative outcomes could arise from poor consideration of community norms, perceptions, or livelihood needs.

Although the concept of fit, particularly social fit, offers an intuitive SES diagnostic appeal, how it can be achieved or diagnosed is not empirically clear (DeCaro and Stokes, 2013). DeCaro and Stokes (2013) for instance, explain that little is known about how best to match types of public engagement to specific SES problems. Indeed, because SESs are complex, and involve multiple actor interests and values, institutional arrangements rarely fit with respect to

[4] Generally, Model Forest (MF) organizations function as non-profit organizations that build voluntary and partnerships with diverse forestry related stakeholders including communities, government and private organizations to support sustainable forest management (IMFN, 2016). Thus, MFs function as bridging organizations that link local actors with multi-actor and level organizations.

all stakeholder groups (DeCaro and Stokes, 2013; Epstein et al., 2015). To improve understanding of the concept of fit, Epstein et al. (2015) comprehensively mapped governance attributes that enhances social fit. Epstein et al. (2015) identified three governance attributes of social fit which are: alignment with the social context, the appropriateness of governance processes and instruments given stakeholder psychological needs and expectations, and alignment with existing levels of social organization (Table 2.1). To achieve social fit and improve the sustainability of a SES within a particular context, specific institutional arrangements are often required to facilitate this process. For example, researchers have shown that BOs perform several roles and responsibilities to address specific attributes of social fit (Green et al., 2015; Berdej and Armitage, 2016). Crona and Parker (2012) define BOs as "organizations that link diverse actors or groups through some form of strategic bridging process" (p. 32) to offer a flexible organizational concept for the governance of complex SESs (Sternlieb, Bixler, and Huber-Stearns, 2013).

Some studies have shown that BOs are effective at designing governance arrangements when they align with specific social contexts and satisfy actor expectations (Hahn et al., 2006; Olsson et al., 2007; Berdej and Armitage, 2016). In Sweden, to reverse the degradation of flooded meadows due to decline in traditional activities, a BO helped to build social support and capacity among a diversity of stakeholders through education and awareness about the importance of the meadows; expanded access to the landscape for educational and recreational purposes; and built participants emotional drives such as sense of place and identity (Schultz et al., 2007). In Romania's Saxon region, characterized by extensive farmland abandonment, NGOs are helping community-based institutions re-establish a sense of land-based identity through the development of new markets for organic farm products (Fischer et al., 2012). Also, to enhance the appropriateness of the rule-making processes in a conservation program in Indonesia, Berdej and Armitage (2016) showed that BOs supported the creation of multiple governing structures and inclusive decision-making processess through public meetings. Thus, the BOs' responsiveness to actor expectations created opportunities for meaningful participation of several actors.

BOs are also critical in connecting, coordinating and supporting different levels and scales of governance – community, regional, national – to enhance fit. In this context, the leadership (Olsson et al., 2007) and networking (Berdej and Armitage, 2016) roles of BOs are important. BOs can also facilitate the integration and networking of diverse social organizations through vertical and horizontal collaboration (Schultz, 2009) especially between loosely connected

actors (Olsson et al., 2007), providing access to a pool of financial resources, and integration of scientific and experiential knowledge (Hahn et al., 2006).

While the concept of social fit can provide a useful diagnosis of governance processes associated with underutilized landscapes, there is less understanding of the implications of social fit for the practice of transformation. Thus, for this paper, we focus on identifying bridging functions that enhance social fit - alignment with the social context, the appropriateness of governance processes and instruments given stakeholder needs and expectations, and alignment with existing levels of social organization – and consider how these efforts improve the recoupling of human-ecosystem relationships in underutilized forested landscapes. Table 1 shows the specific attributes of social fit and their key challenges in the context of underutilized landscapes. We apply our analysis to a landscape-level Model Forest operating in Kyoto, Japan.

Table 2.1 Relationship between social fit and transformation outcomes based on literature review.

| Key components of social fit | Explanation | Key questions related to how BOs can enhance social fit in the context of decoupled landscapes. |
|---|---|---|
| Alignment with the social context | Governance institutions should match the dynamic social, political, cultural, and economic characteristics of the social system. | How do BOs identify and integrate existing and new resource users, their interests and priorities in transforming underutilized landscapes? (Fischer et al., 2012; Hobbs, 2009). |
| Appropriateness of governance arrangements given actor needs and expectations | Governance processes and instruments should be right given the expectation and psychosocial needs of actors | Are BOs able to foster meaningful stakeholder participation that leads to greater motivation and long-term commitment to ecosystem management? (Tanaka and Inoue, 2015) |
| Alignment with diverse social organizations | Governance institutions should be connected to enable the leveraging of the distinctive resources and capacities of | How can BOs connect multi-level actors and institutions to the local scale and vice versa to build broad motivation and support for |

| | | |
|---|---|---|
| | actors across existing scales and levels | ecosystem management? (Takeuchi et al., 2016) |

Source: Adapted from Epstein et al. (2015) and Berdej and Armitage (2016)

## 2.3 Study Context and Methods

### 2.3.1 Forest governance in Japan

About two-thirds of Japan is covered by forest, with most owned by small-holder individual households (Iwai, 2002). As such, the traditional connections between people and forests are intimate and remain a significant part of Japanese culture (Iwai, 2002), with such linkages seen as key to contemporary conceptualizations of sustainability. Yet, forest governance in Japan faces several challenges. Key among them is the mismatch between forest ecosystem dynamics and the social institutions that guide forest use and management (Duraiappah et al., 2014). Changes in socioeconomic and demographic patterns (i.e., the shrinking and aging of rural population through rural-urban migration and increasing external dependence on imported timber products) since WWII, together with the economic boom of the 1950's, have driven the underutilization and, in some cases, abandonment of forest ecosystems, thereby weakening local institutions that have customarily governed forest management (Duraiappah et al., 2014; Takeuchi et al., 2016). These changes have resulted in negative ecosystem feedbacks, particularly the loss of forest biodiversity and a decline in the environmental functions of forests (Yashiro et al., 2013). For instance, Okada (1999) reported that indigenous plant and animal species, having successfully adapted to periodic cutting and burning to maintain agricultural lands, open forest lands, and secondary coppice forests, are now threatened with extinction due to rural landscape abandonment. Iwai (2002) also reported that the lack of thinning of Japanese cedar plantations has damaged understory vegetation and contributed to the erosion of forest topsoil, increased tree susceptibility to wind damage and disease.

These challenges have led to a greater emphasis on the public benefits of forests, such as regulating ecosystem services (Iwai, 2002), and as sites of socio-cultural significance (Berge and McKean, 2015). Government agencies have begun to emphasize incentives such as education and information to concerned stakeholders; incorporation of forestry planning into local municipal plans (Kakizawa, 2015); and changes in property right regimes to allow for forests to be managed with a mix of government ownership, private ownership, and communal ownership (Yashiro et al., 2013). These initiatives have enhanced the participation

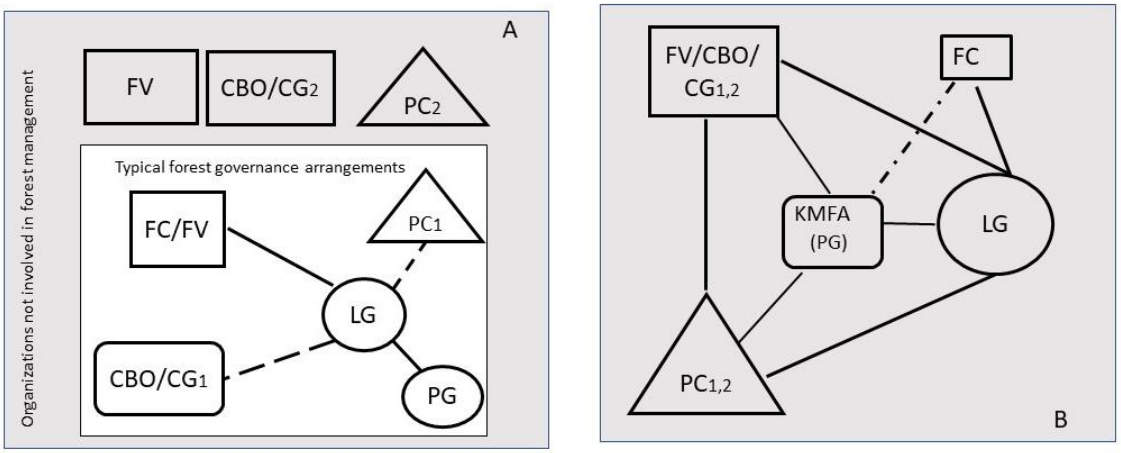
of urban residents in forest management, convened by NGOs and local governments (Tanaka and Inoue, 2015; Shimada, 2015). Such arrangements have been shown to provide local ecological benefits as well as emotional, cognitive and spiritual benefits for participants (Yoshida et al., 2015).

Despite the emphasis on public involvement in forest management, Tanaka and Inoue (2015), argue that coordination of the public's role in forest management planning remains a fundamental challenge. According to Kakizawa (2015), there is rarely a clear formula to follow – particularly between foresters within local municipalities, prefectures, and central government – to help determine who performs what role and in what capacity. In this context, BOs have been viewed as one means to address this challenge and secure more efficient and sustainable management of forests (Duraiappah et al., 2014). We explore this possibility by focusing on the KMFA.

### 2.3.2 Kyoto Model Forest Association (KMFA)

For this paper, we focus on the Kyoto Model Forest Association (KMFA) as our case study BO. The KMFA was set up in 2006 through the leadership of the Kyoto Prefecture, with a focus on "mori-zukuri" (forest management) by mobilization of residents, government agencies, academics, civil society organizations, and private corporations[5] to re-establish human relationships with the forest (Ozawa, 2014). The KMFA helps connect these groups to forest communities so as to support forest management (Figure 2.1). Each of the participating organizations functions as a self-organized group involved in socio-cultural activities related to forestry. Participants are connected to the forests in multiple ways via material (e.g. mushroom and bamboo shoot harvesting and firewood collection), experiential (e.g. thinning, weeding, tree planting, timber utilization, and monitoring), and cognitive (e.g., having fun in the forest) forms (Appendix C).

[5] The range of corporations involved in the KMFA is diverse and includes beverage, telecommunication, manufacturing, banking and insurance, and utility corporations. Some of the corporations are small or medium-sized, with operations only in Kyoto, while others are large and transnational.




Section A shows the typical forest governance arrangements in Kyoto. As can be observed local governments (LG) are the main coordinating agencies for forest management – working with forest cooperatives and volunteers (FC/FV) – while the prefecture government (PG) provides policy direction and funding. However, there are fewer opportunities for actors to collaborate, particularly to learn from each other. Also, relationships (shown by dotted lines) are weak. Additionally, several potential actors – private corporations ($PC_2$), community based organizations ($CBO_2$), citizens groups ($CG_2$) and forest volunteers (FV) – are outside the formal forest governance arrangements.

In Section B, the KMFA has transformed forest governance arrangements. First, the leadership and facilitation role of KMFA has provided opportunities for new actors to participate in forest management. Second, collaboration has been enhanced at all levels and sectors. This has helped to enhance resource flow, knowledge mobilization, learning, and to define roles and responsibilities of actors. Third, prefecture government (PG) has also become centralized since it maintains a close relationship with the KMFA. Yet, the collaboration between KMFA and Forest cooperatives (FC) – who are mostly involved in commercial timber and wood utilization – remains weak.

Figure 2.1 Improvements in institutional arrangements for forest governance by the KMFA

In studying the KMFA, we were particularly interested in understanding how the Model Forest engages diverse actors to support recoupling of people-forest relationships at multiple levels. The KMFA facilitates collaboration between these actors via a forest management agreement (in most cases, 10-year renewable), which specifies the roles to be performed and by whom. The Kyoto Prefecture is a signatory to most of the agreements, while local and municipality governments also serve as partners. As of March 2016, there were 38 private corporations with agreements in 35 locations (Figure 2.2), with 27 local governments and 122 forest activity group partners in these arrangements.

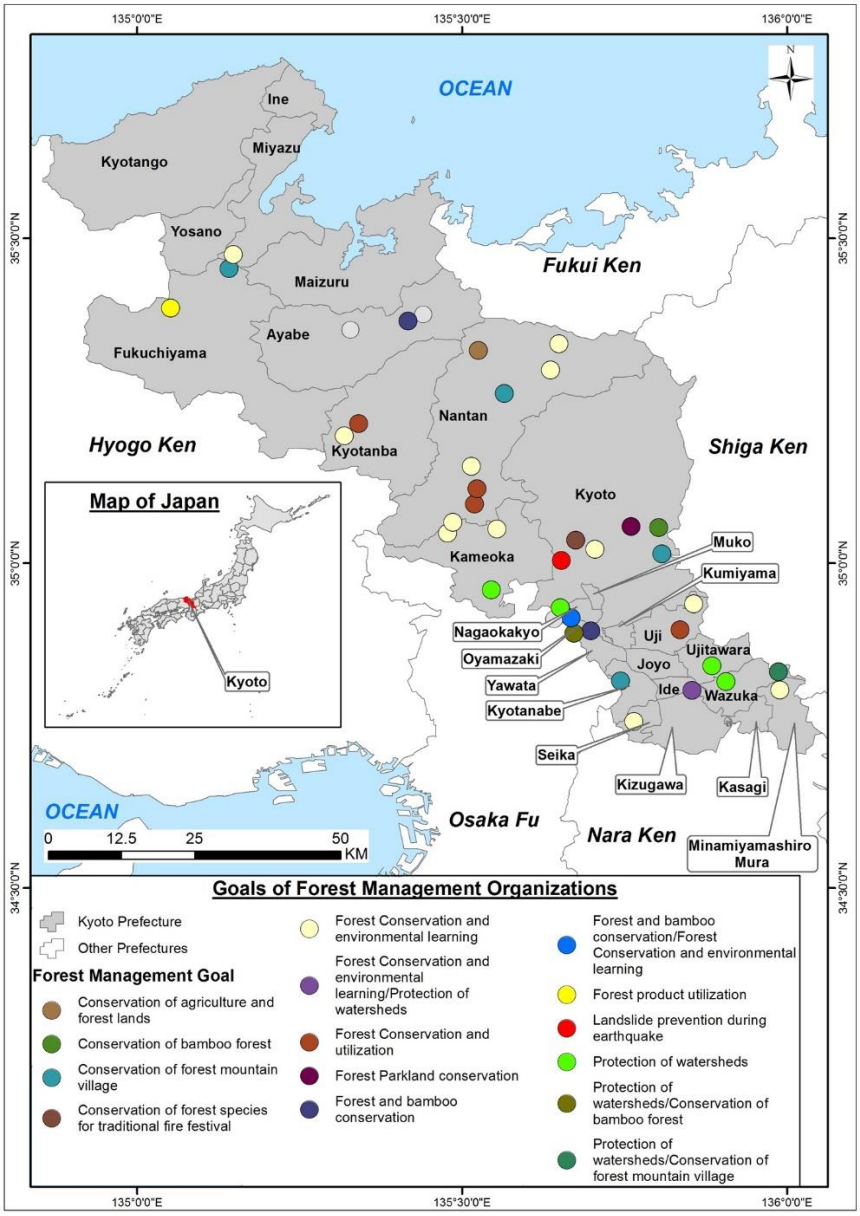



Figure 2.2 The location and goals of participating private organizations in local forest management.

Source: Adapted from KMFA.

## 2.4 Research design

The study employed a mixed-method case study approach, focusing on external evaluation whereby the researchers observe and gather information from stakeholders and documents (see Trimble et al. 2015). Key methods were document analysis, semi-structured and group interviews, questionnaire survey, field visits, and participant observation. Primary research was conducted by the lead author between January and March 2016.

Key informant interviews were conducted with the leadership of the KMFA and representatives of stakeholder groups connected to the organization. In total, 14 semi-structured interviews were conducted, involving 2 KMFA staff (the general manager and manager), 5 representatives of private corporations, 5 local volunteer group leaders, and 2 municipal forestry officials from the city of Kyoto. Specifically, actor roles and responsibilities, relationship-building, motivations, experiences and challenges were discussed. Two separate group interviews were also organized with forest volunteer groups. The first meeting was organized with 12 male participants from Nagaoka city. The meeting took place on a forest site and during the group's regular management activity. Except for one person who was introduced as the leader, the rest were regular members. In the second meeting, 5 male participants (3 leaders of different volunteer groups and 2 members of one volunteer group) attended from the Nishiyama area. Participants in the group interviews had between 5 and more than 10 years of volunteer experience. The group interviews afforded the opportunity to understand the activities of the group, and their motivations, and relationship with the KMFA and other stakeholders. The lead author also undertook participant observations and field visits which enabled first-hand appreciation of local forest landscapes, the management activities performed by participants, and challenges encountered (Appendix B, Table B.3). In these events, recorded observations and informal discussions also revealed motivations, experiences and challenges.

A questionnaire was developed and administered to solicit information from all stakeholders of the KMFA. The questionnaire included both closed and open-ended questions and explored the perceptions of respondents, particularly their satisfaction in the governance process and instruments used by the KMFA. The questionnaire was translated into Japanese and pretested before being administered. In total, the survey was sent to 148 respondents – including private corporations (41), local forest activity groups (80), and local governments (27) – using online (google forms), email (word attachment) and mail. At the end of the survey period, 41 completed questionnaires were received for a response rate of 27.7 percent. Almost half and 18% of survey respondents were private corporations and local forest activity groups respectively (Appendix A, Table A.1). Responses were translated from Japanese to English before analysis.

Organizational and operational-related documents were translated and carefully reviewed to determine the KMFA's goals and primary activities. In addition, the forest management activity reports of 36 private corporations over a 10-year period were reviewed to determine their objectives, activities undertaken and challenges to participation (Appendix G, Table G.1).

NVIVO was used to analyse the interviews and documents with a focus on identifying themes related to bridging functions that enhanced social fit. The data were coded and analysed for the bridging functions identified in the literature, as well as for emergent bridging functions raised by the sources.

## 2.5. Results – The role of KMFA in recoupling people-forest relationships

### 2.5.1 Alignment with the social context

The KMFA's primary goal is to '*support and expand the nucleus of activities and groups involved in cooperative efforts to strengthen people-forest relationships in Kyoto'* (KMFA, 2017a). To achieve this goal, the KMFA worked to identify, integrate and represent diverse actors, values, and interests in forest management in line with the high public expectation and contemporary policy focus on broadening citizen's interests in forest management through collaborative actions (see Iwai, 2002). Based on our findings from the interviews, observations and documents, we found a range of motivations (Appendix C), forest uses (Figure 3), and forest management objectives (Figure 2) integrated into the KMFAs forest governance program. For instance, in terms of motivations, our findings revealed both intrinsic and extrinsic motivations related to specific stakeholder groups and across different categories of human-nature connections (Appendix C). Intrinsic motivations such as re-establishing forest values as "clean and bright and desirable place" was common to participants across different stakeholder groups. On the other hand, extrinsic motivations such as employee satisfaction and building trust with the public were related to only private corporations (Appendix C).

Our findings revealed that the existence of diverse actors and their accompanying connections to the forest landscape arose because of KMFA's capacity to reach out and appeal to a broad audience using diverse approaches and instruments (Figure 2.3). Below, we describe some of these instruments.

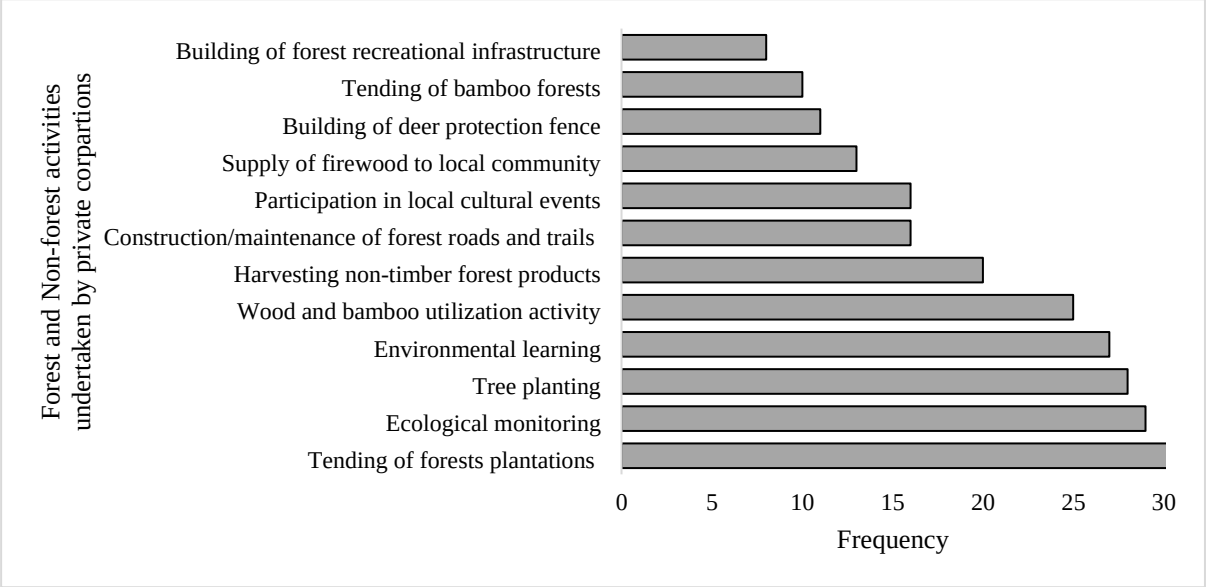



Figure 2.3 Frequency of forest and non-forest use activities reported by private corporations.

Source: Summary of forest management reports.

Table 2.2 Challenges to participation in decisions and activities related to forest management

| Stakeholder group | Challenges mentioned | Source |
|---|---|---|
| Private corporations | • Lack of information on opportunities for participation and decision making on forestry<br>• Time and organizational costs of building partnerships<br>• Cost of managing forestry operations<br>• Safety of staff involved in forest operations | Review of forest management reports; interviews with private corporations; observations at conference and participation in forest management activities |
| Local forestry groups (volunteers and citizens groups) | • Lack of information on opportunities for participation and decision making on forestry<br>• Safety of volunteers in forest work<br>• Low participation of young people in volunteer work | Individual and group interviews; observations at conference; and participation in forest management activities |

| | |
|---|---|
| | • Difficulty in recruiting volunteers<br>• Uncertainty about the long-term commitments of private corporations |

*Communication, recruitment, and knowledge dissemination*

Interview findings across different stakeholder groups revealed that access to information on how to participate in collaborative forest management is one of the main barriers to participation (Table 2.2). Similarly, different speakers at the forestry conference reiterated the need to reach out to more organizations and individuals to support forest work. According to an official of the KMFA, the organization works to '*draw peoples' attention to the present condition of forests, and through that create an awareness among the public of how they can get involved to restore the lost functions of forests*. To achieve this, the KMFA used different media such as public communication, information dissemination, and recruitment campaigns. For instance, the majority of private sector participants indicated that they joined the KMFA because of public advertisement and recruitment campaigns by the KMFA (in both traditional and social media), offering an opportunity for participants to partake in activities to restore the functional integrity of Kyoto's forests. In addition, the social media page of the KMFA frequently announces opportunities for people to participate in forest ecosystem conservation activities including attending conferences, workshops, and academic lectures on forests. The annual symposium on model forest activities organized by KMFA is an example (Appendix D). According to the KMFA, the conference provides a medium to not only provide forestry information to a diverse audience but to also identify and elicit information about interests in forestry. In fact, more than half of survey participants considered the forestry conference as one of the ways to communicate to the KMFA (Appendix D).

*Removing transaction costs and enhancing trust*

The cost to participate was identified as a major barrier to participation by both local forestry groups and private corporations (Table 2.2). The KMFA removed organizational and transaction costs to enhance participation. According to the private corporations interviewed, before the emergence of KMFA, the participation of private corporations in forest management was limited to large-scale corporations with well-established Corporate Social Responsibility (CSR) departments or activities directly related to forestry. However, the

KMFA inspired many small-scale private corporations based in Kyoto to participate who lacked the organizational capacity or funding to operate formal CSR projects.

Review of program documents revealed that the KMFA invested in systems and places to make it easy and less costly to participate. Some of these investment arrangements included assembling forestry information – such as the location, size, and forest condition – connecting different actors, and drafting and managing partnership agreements. According to the private corporations interviewed, because the KMFA connected them to local forest groups, barriers such as information, cost, time, and relationship-building were eliminated. This was also confirmed by participants at the symposium during the open forum. Moreover, in the forest management seminar attended by the lead author (Appendix B, Table B.3), a private corporation with a strong CSR department suggested that, because of mistrust by some local communities of the intentions of private corporations, working through the KMFA enhanced trust. Also, participants in the group interviews said that they felt comfortable to partner with private corporations through the KMFA. The leader of the volunteer group said that the KMFA encouraged deliberative arrangements involving face-to-face discussions with a partner private corporation to enhance trust. According to this participant, deliberative arrangements enabled both partners to overcome their differences, jointly define roles and responsibilities, and set long-term goals and visions for the forest management unit.

The KMFA also used a flexible funding scheme to encourage the participation of both private corporations and local forest management groups. Three of the private corporations interviewed said that they were happy to conduct their forestry operations through the KMFA because the KMFA uses a shared funding scheme that makes it cheaper to conduct forestry operations. Under the arrangement, corporations paid for transportation to and from the forest management site, insurance and food. The prefectural government provided a subsidy to cover seedlings for replanting and machinery hire, while local governments and the KMFA provided technical advice and tools. At the same time, local forestry groups indicated that they were happy to be part of the KMFA because it expands the portfolio of funding they can access since the KMFA manages several forestry funding programs (prefectural forest subsidy fund, the green forest fund, and the forest development fund). A review of the KMFA's operational document showed that in 2010, 20 local forestry groups received funding to undertake forestry activities such as thinning and pruning, forest road maintenance, and forest net installation (KMFA, 2017b). A local forestry stakeholder stated that the KMFA makes it easy to access funding since it provides not just information about funding

opportunities but also support during the application process, project implementation, and report writing.

*Providing leadership and coordination of diverse forest management groups and organizations at the landscape level*

According to KMFA officials, in Kyoto, there were many self-organized local organizations/groups with forestry-related missions but whose activities were not known to formal forestry institutions. The KMFA provided leadership to integrate and coordinate the activities and interests of local forestry groups through formal registration and representation of their interests at the landscape level. For instance, over 80% of survey respondents expressed satisfaction that the KMFA provided coordination and opportunities for local forestry groups to participate in forest management decisions (Appendix D). However, some participants at the model forest symposium expressed concern about the low participation of timber processing firms in the work of the KMFA. It is therefore not suprising that a majority of survey respondents expressed dissatisfaction with the participation of timber processing firms in the work of the KMFA (Appendix D). An official of the KMFA confirmed that their engagement with timber and wood processing organizations needed to improve.

### 2.5.2 The appropriateness of governance arrangements given actor expectations/needs

In the survey, participants were asked to evaluate the relevance of the KMFA as a coordinating institution in the governance of forests in Kyoto. The findings showed that over 95% of respondents said the KMFA was important (very important 48.8 %, important and somewhat important 24.4% each). Only 2.4 percent said it was not important while 2.6% had no opinion. Two main explanations were given by participants who indicated the KMFA was important. First, some said they believe in and can identify with the goals of the KMFA, while some mentioned the KMFA's networking role. In addition to these, the majority of survey participants expressed satisfaction with several of the governance processes and instruments used by the KMFA in areas such as procedural fairness, inclusivity, information access, training and capacity and relationship building (Appendix D).

In terms of procedural fairness, more than two-thirds of participants expressed satisfaction that the KMFA ensured mutual respect and equality at meetings and promoted fairness between local foresters and private corporations (Appendix D). This notwithstanding, in one

of the group interviews, some participants felt that the KMFA prioritized the interests of private corporations above other stakeholders.

Regarding the appropriateness of training and capacity building, over 80% of participants expressed satisfaction with the training and technical skills provided by the KMFA (Appendix D). In addition, interview participants from both the private sector and local forestry groups confirmed that the KMFA used both formal and informal mechanisms as well as local and scientific knowledge to build skills and capacity in forest management. For instance, the leadership of two volunteer groups confirmed that they had been recruited by the KMFA to offer experiential training on forest management to both volunteers and private company employees. The lead author participated in one such training session for potential volunteers (Appendix B, Table B.3). Similarly, 15 of the private corporations stated in their reports that they had sought the experience of academics and technical forestry experts to either train (e.g., ecological monitoring), undertake specific tasks (e.g., slope thinning), or provide lectures on forest functions, through arrangements by the KMFA.

The KMFA also provided a flexible governance arrangement that satisfied stakeholder needs and expectations, particularly in relation to the provision of awards for contributing to forestry. The staff of the KMFA indicated that the majority of the private corporations expected to be publicly recognized for their contribution to forestry. This was confirmed by the private corporations interviewed. A representative of a private corporation stated, "*The KMFA has awards they give every year. Our forest was chosen for one of 500 'Biodiversity Conservation on Important Satoyama' last year. So being awarded and being talked on the news are important to us, especially for the image of the company and our shareholders."* According to the private sector participants, the awards by the KMFA is an important motivation for their continuous support to forestry since it demonstrates social responsibility and also satisfy the expectations of their shareholders for tangible value from the support provided to forestry.

### 2.5.3 The alignment with diverse social organizations

The KMFA promotes collaboration among governments, the private sector, local communities (Figure 1) and other Model Forests through the International Model Forest

Network[6] (IMFN) to support forest work. Collaboration with the government has enabled it to enjoy political and moral support at the highest level. An official of the KMFA stated that many private corporations responded to their recruitment campaigns to participate in forest management because of their close relationship with the government. The KMFA further revealed that the prefecture has designated it to manage two government forestry programs: the forest subsidy fund, and the forest carbon offset program for local forestry groups or private corporations respectively. The carbon offset program represents Kyoto Prefecture's Anti-Global Warming Regulation. As at 2016, over 60 private corporations had signed on to use their forest management activity to earn carbon credits. Also, the KMFA has networked with over 30 district and municipal government forestry departments. Private corporations interviewed indicated that through the KMFA, they received technical support from local government forestry staff to plan and implement forest management activities.

The KMFA works tirelessly to get private corporations involved in forest management. They are a key source of funding and volunteer labour. Private corporations confirmed that they provided funds to KMFA through membership fees and donations. Local forestry participants stated that without the funds and volunteers of these corporations, many forests would be left unmanaged or the scale of management activities would be reduced.

Finally, the involvement of local forestry groups has enhanced the institutional environment for forest management. By formalizing the participation of local groups, roles and functions of existing local leaders have been enhanced while new institutional arrangements for forest management have emerged to support local forestry work. For instance, leaders of local forestry groups said their roles included identifying, mobilizing, and seeking consent to take over the management of forests whose owners are either old, absent, or have lost interest in them. According to KMFA officials, the most successful forest partnership arrangements are those with active local leaders who can mobilize local volunteers to match the support provided by external volunteers. Yet, representatives from private corporations and volunteer groups interviewed expressed concerns about sustaining local volunteer interest and building enough local capacity so that projects can continue if private corporations pull-out.

### 2.6 Discussion

This study sought to examine how BOs facilitate the recoupling of human-ecosystem relationships in underutilized rural forestry landscapes and to improve the interdependencies

[6] The IMFN is a network of MFs encompassing about 60 large scale landscapes in six regional networks covering 84 million hectares in 31 countries. The IMFN fosters international exchange of ideas and solutions for the sustainable management of natural resources in forested landscapes (IMFN, 2016).

within local social-ecological systems (SESs). Using the concept of social fit, the study found several strategies for BOs to recouple social and ecological systems in the underutilized forest landscapes of Kyoto. Here, we discuss three opportunities.

First, in Japan, although there is increasing emphasis on public involvement in forest management (Tanaka and Inoue, 2015) as a culturally appropriate way to support sustainable use and management of degraded ecosystems (Yanagi, 2012), our interview findings revealed that there are barriers of access, information, and cost that affect meaningful participation (Figure 2.1). Our findings also revealed that the KMFA worked to reduce these barriers and expanded the opportunities for people to reconnect to forests. Interviews with participants, review of reports, and observations showed that the KMFA had invested in places (e.g., locations and attributes of abandoned forests) and systems (e.g., forest management agreements and plans) to reconnect people to forest ecosystems; provided flexible and less costly arrangements for participation; institutionalized the participation of local forestry groups; and embarked on public education and recruitment. For instance, the investments made by the KMFA inspired more private corporations with limited organizational capacity to participate (Figure 2.1). Again, the majority of survey and interview participants across all stakeholder groups expressed satisfaction in the KMFA for providing leadership and a fair and supportive environment to boost their participation. Stakeholder satisfaction with programs and policies indicate institutional acceptance, thereby providing motivation to improve the sustainability of the socioecological system (DeCaro and Stokes, 2013). Thus, relative to institutional acceptance, there is a broad consensus among the stakeholders that the KMFA improved social fit.

Second, the KMFA's ability to draw support from diverse social organizations – such as government agencies, the private sector, and local community – enhanced the effectiveness of the governance processes, particularly to fit with the socio-cultural and policy context of Japan (Figure 1b). Culturally, cooperative arrangements involving all citizens is seen as an appropriate way to support sustainable use and management of degraded ecosystems (Yanagi, 2012). Policy-wise, current forest governance is geared towards collaborative arrangements involving citizens' participation (Kakizawa, 2015). Congruence with institutional arrangements enhances legitimacy and provide grounds for cooperative behaviour and positive institutional outcomes (DeCaro and Stokes, 2013; Meek, 2013). Our findings revealed that the alignment with government policy – measured by the significant involvement of the Kyoto Prefecture in the work of KMFA – provided moral and political legitimacy of the governing process, thereby expanding access to financial, and technical

support to participating actors (Figure 1b). Furthermore, the recognition and engagement of local forestry groups by the KMFA enhanced local self-organization as local leaders said they managed to assume greater leadership roles in identifying land owners, recruiting volunteers, and monitoring management activities. In sum, the KMFA provided leadership to various actors interested in forestry and thereby created new networks and partnerships that enabled institutions and organizations at multiple levels and sectors to become part of a larger landscape problem-solving approach (Figure 2.1b). Such leadership and networking roles by the KMFA in facilitating collaboration among multi-level actors streamlined the roles and responsibilities of traditional forestry actors while broadening participation of new actors (Figure 2.1b). Thus, the networking and leadership roles of the KMFA appear to address the ambiguity associated with the lack of clarity among government agencies that facilitate public involvement in forest management (Kakizawa, 2015). In essence, governance arrangements that transcend different institutional and organizational landscapes can improve social fit (Young, 2002).

Third, our findings further revealed that the KMFA enabled and sustained multiple and novel human-nature connections, thereby improving interdependence among social and ecological systems. Specifically, the KMFA instituted processes that enabled the integration of multiple actors, objectives and uses to forests across different constructs of human-nature connections. The interplay of multiple values, including intrinsic (e.g., have fun, learn and connect with nature) and extrinsic (e.g., health and relational benefits for retired volunteers and improvement in public image for private corporations) motivations provided novel linkages to the ecological system. Establishing direct use linkages to the ecological system is key to the sustainability of transformation policies (cf. Fischer et al., 2012). Although involving diverse actors with varied motivations in ecosystem management raises the potential for value mismatches (cf. Duraiappah et al., 2014), the KMFA avoided this by building trust through the provision of deliberative forums for actors to overcome their differences. Moreover, the KMFA provided incentives and built the capacity of actors to sustain and stimulate the motivations linked to the ecological system. Private corporations emphasized that the KMFA supported them to personalize the benefit of working in the forest through practices that enhanced corporate image and improved employee welfare – factors which appeared to boost their participation.

Finally, more broadly, our analysis reveals that BOs do not operate in a vacuum, and that transformation strategies tend to be complex and thus affected by several contextual factors (Figure 2.4). First, there is the need to consider the influence of the broader institutional

context (2.4.A) on bridging roles in the overall scheme of transformation. For instance, through the IMFN, the KMFA enjoys networking and learning opportunities with other MFs, which could provide opportunities for broader interactions on the work of the KMFA in the future. Also, in Kyoto, the Prefectural government excercised much control on the functions of the KMFA because of the historical relationship between the two and the funding provided by the former to the latter. Although collaboration with government agencies enhanced political and moral support to the KMFA (cf. Meek, 2013), this could have the potential to affect the KMFA's flexibility and innovation. Second, it is important to have a better understanding of the status of the ecological system (Figure 2.4.D), and the kinds of services and products it offers, and for whom. This will help in determining whether bridging functions translate into actual long-term ecological changes (cf. Berdej and Armitage, 2016). Last, although the KMFA worked at multiple levels to align governance arrangements to the dynamics of the social system (Figure 2.4.B), some local participants felt that the needs of private corporations were served better while others expressed uncertainty surrounding the long-term commitment of outside actors to local ecosystem management and the limited number of youth, women, and wood processing organizations. Hence, for governance programs involving many stakeholders, the extent and type of social fit achieved may be different for different stakeholder groups.

Despite these challenges, our study highlights the salient role of BOs to catalyse transformation outcomes. Specifically, our study revealed that, in Kyoto, bridging functions (Figure 2.4.C) that prioritized the provision of education and information to the public; invested in places and systems where people can meaningfully reconnect to ecosystems; and reduced transaction costs; built trust and reduced value mismatches; provided incentives to sustain and stimulate motivations; and offered leadership to network and to draw support from diverse organizations, held great potential to improve peoples' relationship with forests. The improved interdependence among the social and ecological systems can be seen in three main ways (Figure 2.4.E). First, leading and networking diverse forestry related organizations, the KMFA enabled the existing institutional arrangements for forest management to be streamlined and the roles and responsibilities of different forestry actors to be clearly defined and supported. Second, the institutionalization of local forest groups by the KMFA boosted the morale of those groups and enabled new local leaders to emerge. The emergence of active local leaders enhanced local stewardship and helped create new forms of direct and indirect linkages to forest ecosystems. Actors with diverse motivations, including social and cultural identity, education and learning, and health, were motivated to participate.

In the long term, leveraging these motivations would enable more actors to be inspired and to strengthen or develop new links with the ecological system.

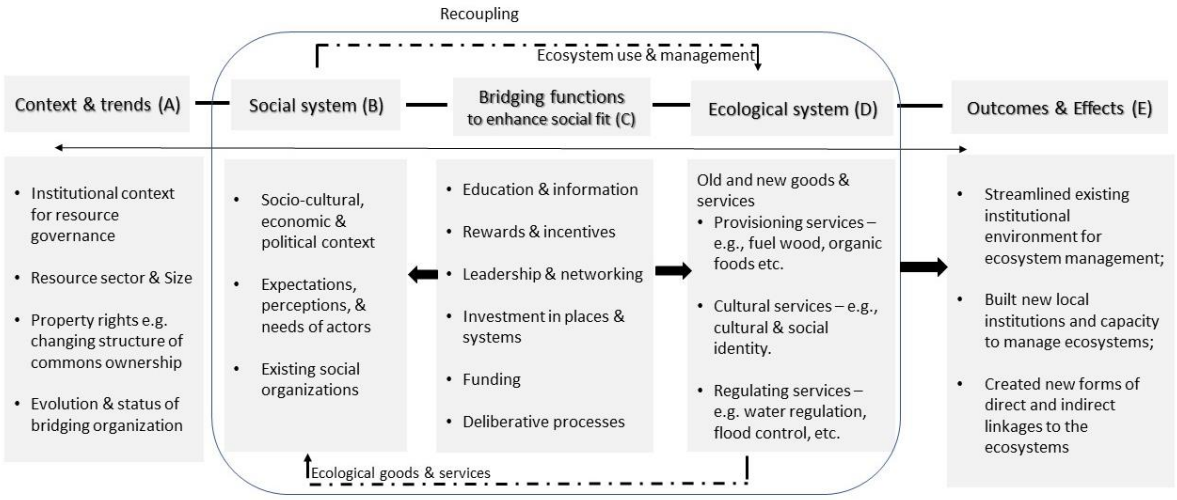



Figure 2.4 Transformation arrangements for improved human-ecosystem relationshps

## 2.7 Conclusion

The lack of fit arising from the decoupling of human-ecosystem relationships in hitherto human dominated landscapes presents a particular, yet increasingly common, governance and management challenge. Through the lens of social fit, our research in Kyoto, Japan, offers empirical understanding on how multi-level actor participation can be used to address human and ecosystem decoupling. More so, we elucidate the critical role played by BOs in the process. Although there are several bridging functions highlighted in the literature, we found that in Kyoto, those functions that were particularly relevant to (re)building relationships were those that prioritized public education and access to information; invested in places and systems where people can meaningfully reconnect to ecosystems; reduced transaction costs; built trust to reduce value mismatches; created incentives to satisfy needs and expectations and stimulate motivations; and fostered leadership and networking to draw support from diverse organizations. Our findings offer a starting part in understanding how BOs can enhance social fit to recouple social and ecological systems. Since social fit is very dynamic and stakeholder dependent, future research could track satisfaction over time and/or could employ social network analysis to deepen understanding of functional and collaborative linkages found among the stakeholders belonging to the KMFA. Although we do not claim that BOs alone hold the key to addressing the specific challenges of underutilized landscapes, our study provides context-specific understanding of how BOs, such as the KMFA, can

operationalize transformation strategies to better enhance the recoupling of social and ecological systems.

## PREFACE TO CHAPTER 3 – THE PARTICIPATION OF NON-INDUSTRIAL PRIVATE FOREST OWNERS IN FOREST CERTIFICATION PROGRAMS: THE ROLE AND EFFECTIVENESS OF INTERMEDIARY ORGANIZATIONS.

The preceding chapter provided an empirical understanding of how a BO, that is, the KMFA, facilitated private-social partnership arrangements to enhance local-led efforts to improve human-ecosystem interdependence in Kyoto, Japan. Based on the evidence provided, the chapter concluded that BOs play a critical role in convening appropriate governance arrangements to align with the dynamic social conditions within specific socio-ecological systems. However, the chapter also highlighted that strategies to align governance arrangements to the dynamic social context that improve human-ecosystem interdependence tend to be complex and dynamic with different stakeholder perceptions of effectiveness. Particularly, the chapter highlighted that compared to private and governmental actors, local actors felt that their needs and interests were less accounted for in the governance process. This suggests that the effectiveness of BOs to enhance the needs, interests and values of local actors in private-social partnership arrangements are not always guaranteed. Thus, it is important to examine specifically how BOs can enhance the needs, interests and values of local actors in governance arrangements that involve diverse stakeholders at multiple levels. Hence, to improve our understanding of the effectiveness of BOs in improving the effective participation of local actors in multi-level governance arrangements, the next chapter examines how the EOMF, operating under a different institutional and socio-ecological context, improves the effective participation of local actors in a private-social partnership arrangement, specifically, forest certification. The findings from the chapter provided a new framework to broaden understanding of how BOs or intermediaries work to enhance the effective participation of private small-scale foresters in a market-based ecosystem governance arrangements.

# CHAPTER 3 – THE PARTICIPATION OF NON-INDUSTRIAL PRIVATE FOREST OWNERS IN FOREST CERTIFICATION PROGRAMS: THE ROLE AND EFFECTIVENESS OF INTERMEDIARY ORGANIZATIONS


## Abstract

Group forest certification programs are a relatively new market-based policy tool designed to enhance the inclusion of small-holders, including Non-industrial Private Forest Owners (NIPFOs) in forest certification systems. However, our understanding of the institutional arrangements that enhance the effective participation of small-holder foresters in certification programs is limited. Our purpose was to assess the role and effectiveness of intermediary organizations in promoting the participation of NIPFOs in a forest management certification program. We focused on the Eastern Ontario Model Forest (EOMF), Canada– an intermediary organization – which facilitates the certification of woodlot owners under the Forest Stewardship Council's group certification program. We employed a mixed method approach involving questionnaires, document review, semi-structured interviews, and field observations. Our findings show that the EOMF's role in the certification of NIPFOs falls under three broad categories and program implementation phases. These are program design and implementation (early-phase), routine administrative and organizational work (take-off phase), and organizational and financial sustainability (long-term phase). Across the different phases of the program, attributes of the EOMF that enabled it to perform effectively were its capacity to (a) build social capital and run the certification at relatively low cost, (b) provide specialized locally relevant forestry services required by landowners, and (c) adapt and innovate to program changes and stakeholder demands, particularly in the medium to long-term phases. However, the major constraining factors to the EOMFs' effectiveness were poor market benefits, instability in donor funding and perceived inequity in group dynamics. We argue that intermediaries are important not only to reducing the challenges that limit the participation of small-holders in certification but also play important roles in optimizing market-based governance arrangements to better respond to local needs and interests.

### 3.1 Introduction

Globally, the quest to achieve sustainability in forest management remains a significant regulatory governance challenge (Marx and Cuypers, 2010). For some time now, the failure of states and international institutional arrangements to halt the problem of unsustainable forest management (Van Waarden, 2009) led to the increasing role of non-state market governance mechanisms (Cashore 2002; Pattberg 2005), particularly voluntary third-party certification systems to drive the achievement of sustainable forest management (Auld et al., 2008; Kurttila et al., 2000). Forest certification primarily involves the action of a third-party to demonstrate that forest management or forest operations are sustainably managed in conformity with specific ecological, economic, and social standards (Kurttila et al., 2000). For instance, a Forest Management Certification (FMC) verifies that a forest is managed in compliance with established standards. While forest certification now features prominently in forest management, marketing and policy worldwide, certification in principle has generated significant debate and critique in terms of its equity and effectiveness, the validity of its claims, practicability, and accomplishments (Glasbergen, 2018; Bakker, 2014; Auld et al., 2008; Kurttila et al., 2000). For instance, in developed and developing countries, concerns have been raised about the difficulty for small-holder foresters – including private non-industrial, family owned, and community managed forests – to access certification due to high costs, stringent entry requirements, and difficulties complying with certification standards (Crow and Danks, 2010; Molner, 2004; Bakker, 2004).

To enhance the participation of small-holder foresters, some existing certification systems have adopted region-specific standards and requirements tailored to the needs and capacities of small-holder forest owners. For instance, in 2004 the Forest Stewardship Council (FSC), one of the foremost certification bodies globally, developed the Small and Low Intensity Managed Forest (SLIMF) protocols with streamlined administrative processes to enable the participation of small-holder foresters (FSC, 2017). Yet, small-holder forest certification systems remain a relatively new policy tool, and their impacts and effectiveness are not well understood (Hoang et al., 2015; Bakker, 2014; Auer, 2012). The majority of existing studies on small-holder certification systems are mostly focused on the agricultural sector and in the global south (Glasbergen, 2018). Studies focusing on the forestry sector are limited to the adoption of certification by community forestry enterprises or cooperatives (see Davies et al., 2015; Wiersum et al., 2013; Crow and Danks, 2012) relative to that of Non-Industrial Private Forests Owners (NIPFOs). Although other studies have focused on NIPFOs owners (see

Mercker and Hodges, 2007; Kilgore et al., 2007; Rotherham, 2002; Rickenbach, 2002), most were undertaken before the development of small-holder certification programs (Crow and Danks, 2010). Thus, understanding of the practicality and effectiveness of certification for NIPFOs remain unclear. Improving understanding of how NIPFOs can effectively participate in certification will help to better understand the potential costs and benefits of certification relative to the objectives for owning and managing forest.

Generally, small-scale forests are complex and difficult to govern because of their relatively small size, dispersed nature across wide landscapes, and diversity of motives for their management (Neave and Wolthausen, 2004; Fung and Conway, 2007). Also, most rural forest communities are often poorly situated in terms of scale, information, capital, and technology (Molnar, 2003). These characterization affect not just the governance of small-scale forests but also their access to markets (Crow and Danks, 2010). Also, since NIPFOs are often charecterized by small volumes, mixed species and irregular harvests (Crow and Danks, 2010) their market potential can be limited (Butterfield et al., 2005).

Given these complexities, intermediary organizations serve as the main institutional anchor to organize and facilitate the participation of NIPFOs in most market-based payment for environmental services programs including certification (FSC, 2017; Davies et al., 2014). Cook, Couldrick, and Smith (2017) defined intermediaries as actors (e.g., middlemen, mediators, facilitators) who undertake functions that facilitate transactions between buyers and providers of ecosystem services. While some researchers have examined how intermediaries facilitate the participation of community forestry enterprises or cooperatives in forest certification (see Davies et al., 2014; Crow and Danks, 2012), their role in supporting NIPFOs has not been explored. The objective of this study is to assess the role and effectiveness of intermediary organizations in enhancing the participation of NIPFOs in group Forest Management Certification (FMC) program. The study focuses on the role of the Eastern Ontario Model Forest (EOMF), which acts as the manager of an FSC group FMC for woodlots owners in south-eastern Ontario, Canada. The research focus on Canada is important because Canada has the largest area of third-party certified forests globally (Natural Resources Canada, 2017), although dominated by large publicly owned forests relative to NIPFOs (Wyat and Bourgoin, 2010). Thus, our Canadian example helps to explain how intermediaries can support small operators to certify, align certification to their needs and interests, and become effective in their operations.

For our purpose, and based on a review of the literature, we operationalize the concept of effectiveness to mean the capacity of an intermediary organization to address the challenges that limits the participation of NIPFOs in certification (e.g., reduce transaction costs of participation), improve the benefits of certification for NIPFOs (e.g., enhance market access and price premiums), and contribute to broader local conservation efforts. Our definition of intermediary effectiveness combines both the objectively-defined goals of certification as well as a problem driven approach that focuses on the interests, needs and values of local actors. Our study supports Glasbergen's (2018), call for a shift in research on certification from a focus on the objectives of voluntary standard-setting as the reference point to how certification aligns with the interests, needs and prefences of local actors in the value chain.

We begin with an overview of the role of intermediaries in market-based instruments (MBIs) for ecosystem management. Next, we describe the study context, with a focus on the EOMF's FMC program, followed by our methods. Subsequently, we discuss our results and highlight the roles performed by the EOMF across different program phases of the certification program and consider the implications of these for the effectiveness of the intermediary organizations. In concluding, we outline policy implications for design and implementation of certification programs on private lands.

### 3.2 Market-based instruments for environmental services, intermediary roles and effectiveness

Market-based instruments (MBIs) for environmental management refers to 'regulations that encourage behaviour through market signals rather than through explicit directives' (Starvins, 2003, p. 358). An example of MBIs include Payment for Ecosystem Services (PES) involving all forms of voluntary approaches to providing clean air, water, sustainable farm and forest products, carbon sequestration, and other outputs from the environment through market-based, government-led, or other types of transactions (Muradian and Gomez-Baggehun, 2013). Thus, certification is often considered broadly as a component of PES since both seek to link production/protection of environmental goods with compensation for landowners (Davis et al., 2014; Wunder, 2006). Wunder (2006), also suggested that PES arrangements overlap with certification since they both involve voluntary approach, have high reliance on economic incentives and directly targets conservation.

An important component of all forms of market-based PES arrangements are the role of intermediaries which could be a non-profit organization, government agency or consultants

(Davis et al., 2014). Intermediary roles in market-based PES arrangements are important because extensive time, labour, travel, and supplies needed to design, organize, implement, and manage (Coggan et al., 2013). For instance, to lower the transaction cost of landowner participation in market based PES arrangements, intermediaries can help to reduce asymmetrically distributed information by drawing on existing social networks and established administrative structures (Schomers et al., 2015). Bosselmann and Lund (2013), suggest that ineffective transaction cost management can reinforce inequalities in participation rather than promote inclusiveness. Table 3.1 shows a summary of intermediary roles often highlighted within the broad market-based PES literature. In table 3.1, there are four major roles performed by intermediaries. These include: scoping and scheme design; scheme administration; representation and mediation; knowledge generation and exchange (Cook et al., 2017; Huber-Stearns et al., 2013). As can be observed in table 3.1, most of the intermediary roles are focused on arrangements or process management standard implementation. Also, compared with the broader PES literature, studies focusing on intermediary roles in the certification of small-holder foresters are scant with the exception of few studies (see Crow and Danks, 2012; Davis et al., 2014). Moreover, in the certification literature, what is less emphasized is how certification can be optimized to improve local sustainable forest management and landowner well-fare (Glasbergen, 2018). Thus, we argue that assessment of the effectiveness of intermediary roles in small-holder certification needs to highlight how certification can be used to address the local-level forest sustainability challenges faced by landowners. The extent to which certification can help address local landowner motivations, needs and interests can enhance the transformative capacity of certification in sustainable resource management (Glasbergen, 2018).

Table 3.1 Synthesis of intermediary roles in payment programs for environmental services

| Type of intermediary roles | Description of intermediary roles |
|---|---|
| Scoping and program design | Could involve organizing stakeholders to inform and obtain input into program design, e.g., actor eligibility and spatial targeting (Schomers et al., 2015) and translating program standards to local context (Crow and Danks, 2010). |
| Program administration and coordination | Actions to deliver program objectives such as promoting the program, performing administrative duties (Huber-Stearns et al. 2013), managing contracts (Bosselmann and Lund, 2013), administering |

| | |
|---|---|
| | program funds, monitoring, auditing and reporting (Cook et al., 2017) and facilitating markets or directly marketing (Davies et al., 2014). |
| Networking, representation and mediation | Involves facilitating networking among organizations to build social capital, knowledge exchange and resource access (Cook et al., 2017; Huber-Stearns et al., 2013). Also involves representing the interests and concerns of all stakeholders including resolving disputes as well as developing new markets (Crow and Danks, 2010). |
| Information, knowledge generation and exchange | This involves influencing policy and practices through providing accessible information about the program's worth to stakeholders, the public and to potential participants (Cook et al., 2017; Huber-Stearns et al., 2013). |

Across different jurisdictions, findings from the literature suggest that reasons for landowner participation in certification are diverse, context specific, and often beyond the objectively defined rational for promoting certification. The majority of findings have shown that, (1) landowner interests, knowledge and awareness; (2) alignment of certification aims with landowners values; (3) costs; and (4) market access and benefits are some of the common reasons or determinants for participation (Auer, 2012; Crow and Danks, 2010; Wyatt and Bourgoin, 2010). In Quebec, Canada, Wyatt and Bourgoin (2010) found that woodloot owners' participation in certification is affected by price premiums, market demand and pressure from timber buyers. In the USA, Ma et al. (2012) and Creamer et al. (2012) found that access to professional forest management advice or information were significant factors in landower adoption of forest certification.

Beyond individual level factors, the prevailing institutional environment can also affect an intermediary's ability to enhance landowner participation. For instance, studies in the USA and Costa Rica demonstrate that locally-based intermediaries with pre-existing networks and roles in natural resource management have the legitimacy to work with small landowners who are often sceptical of a government agency or non-profit organization (Davis et al., 2015, Bosselmann and Lund, 2013). In addition, in China and Vietnam, He et al. (2015) and Hoang et al. (2015) respectively found that small-holder certification schemes depended strongly on donor support – financial and technical – because local intermediary organizations had limited professional capacity in SFM.

Guided by the need to understand in proper context how intermediary roles in market-based PES contribute to effective landowner participation in certification, we developed an analytical framework (Figure 3.1). Drawing from our findings, we have re-categorised intermediary roles (Table 3.1) into three types that characterize the different phases of a certification's program implementation (Figure 3.1). These include program design and implementation (early-phase); routine administrative and organizational work (take-off phase); and organizational and financial sustainability (long-term phase). In each category, the specific roles by an intermediary may differ depending on program type, local context, and intermediary capacity. It is important to state that some of the roles could occur in more than one phase of a program's implementation, e.g., networking and recruitment. However, by highlighting specific roles in specific program phases, we show where these roles are relatively significant. We also consider how these roles contribute to effectiveness based on a review of the literature. To reiterate, we define effectiveness to mean the capacity of an intermediary organization to address the challenges that limit the participation of NIPFOs in certification, improve the benefits of certification for NIPFOs, and contribute to broader local conservation efforts. Our results and discussion sections highlight specific intermediary roles found within each program phase in the EOMF case study.

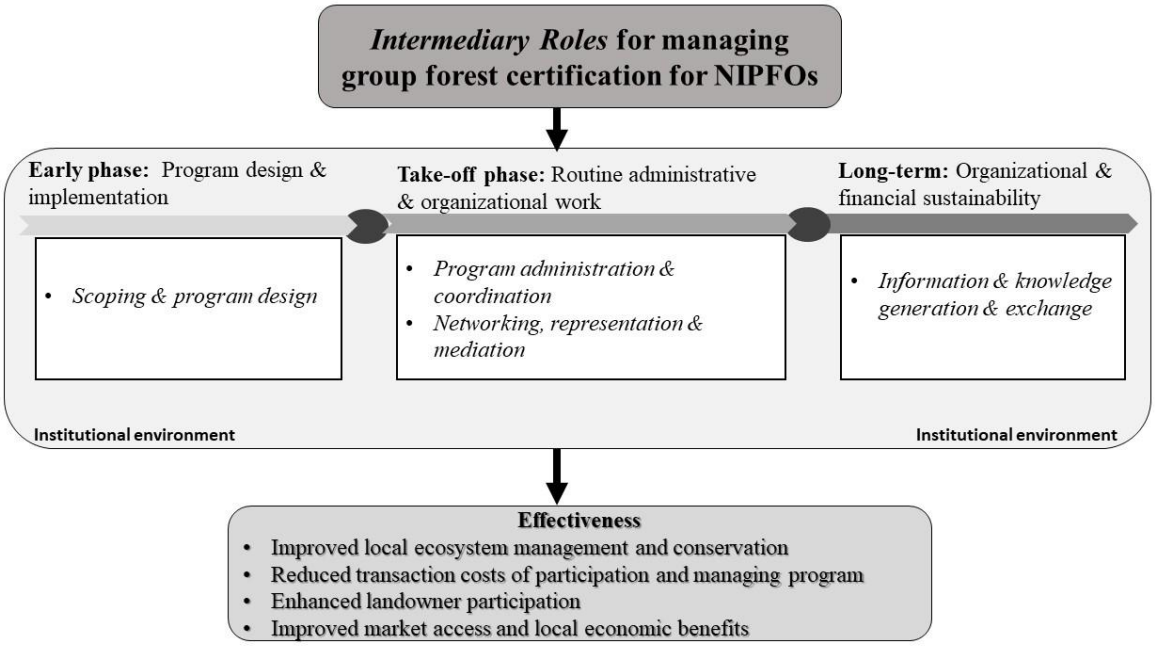



Figure 3.1 A framework for examining intermediary roles and effectiveness in small-holder market-based ecosystem governance.

### 3.3 Context and methods

#### 3.3.1 The Eastern Ontario Model Forest (EOMF) and its Certification Program

Located in the Great Lakes-St. Lawrence Forest Region of Canada, the EOMF is a not-for-profit, charitable organization established in 1992 (Figure 3.2). The EOMF works with government, private woodlot owners, industry, Indigenous people, non-governmental organizations and others to develop new ways to sustain and manage forests (EOMF, 2015a). The EOMF extends over an area of 1.5 million hectares, and about 34 percent of the land base is forested (EOMF, 2015a).

Over 90 percent of forests in Eastern Ontario are owned privately and range in size from 10 to 100 hectares. In Eastern Ontario, communities continue to rely on the forest for traditional economic benefits such as forest products, maple syrup production, and recreational activities (EOMF, 2015a). However, NIPFOs face several challenges such as lack of technical knowledge and skills to implement forest management and operations (EOMF, 2015a), management of invasive species (e.g. glossy buckthorn (*Rhamnus cathartica*) and Garlic Mustard (*Alliara petiolata*)) and species at risk (SAR) – such as butternut (*Juglans cinerea* and monarch butterfly (*Danaus plexippus*) – and local market access for logs (EOMF, 2015a). Also, reaching out to educate and provide information on best management practices is problematic due to their scattered locations (EOMF, 2015a).

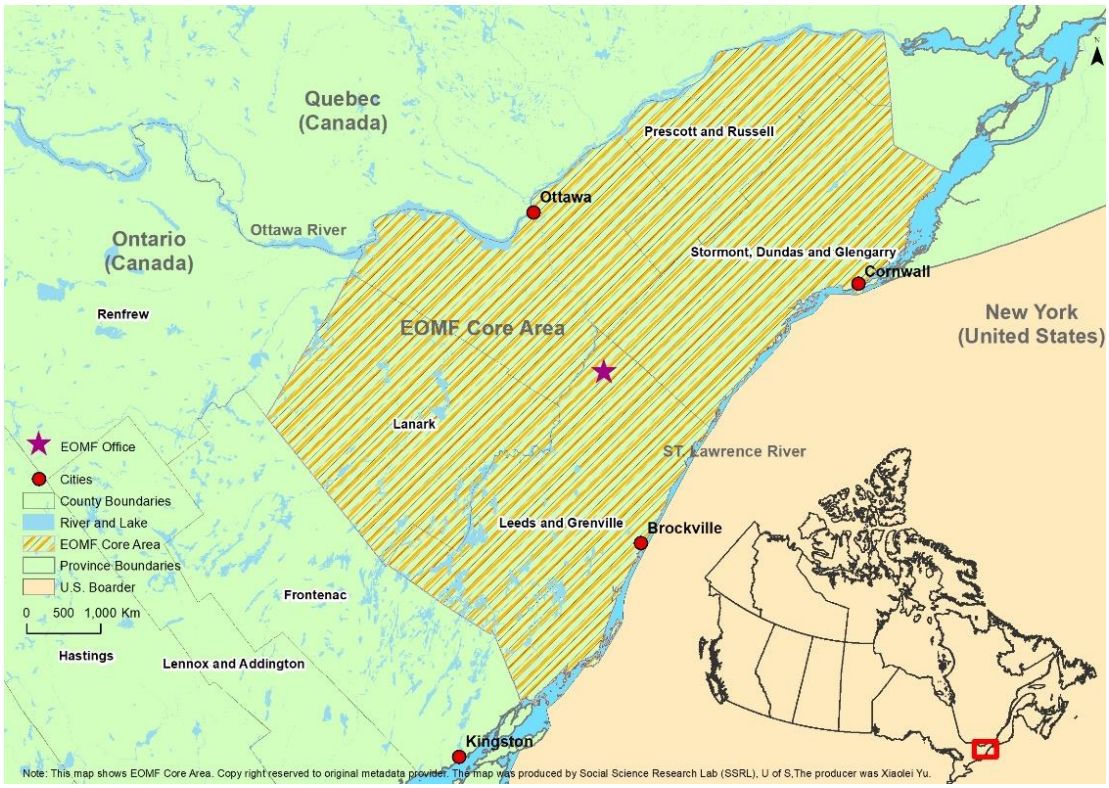



Figure 3.2 The EOMF certification program coverage regions

The EOMF began the Eastern Ontario Forest Group (EOFG) Certification Program in 2003 by acting as manager for the implementation of an FSC group forest certification program as a tool to promote the sustainable management of woodlots. As the group manager, the EOMF holds a five-year renewable forest management certificate. The certificate is renewed after every five years and also annually by independent external auditors. The forest management certificate is managed by a program coordinator supported by a Certification Working Group (CWG). The CWG has representation from the board of EOMF, private woodlot owners, community forests, and government. The CWG provides organizational and technical support for the smooth operation of the program.

The EOFG started with a primary focus on NIPFOs but now includes community and private commercial forests. At its inception in 2003, 1,700 ha were certified, increasing to over 83,650 ha by March 2015 (EOMF, 2015b). As at 2015, there were 114 NIPFOs with a combined property size of 10,466 ha. Also, there are 13 certified community forests (69,086 ha), one commercial forest owner (2,025 ha) and three private forests managers overseeing 29 forest properties measuring 2073 ha. Our study primarily focused on the participation of NIPFOs.

### 3.3.2 Study design and data collection

This study employed a semi-structured interview, a questionnaire survey and field visits. Certification program documents and yearly summary of audit reports from 2004 to 2016 were also analysed to provide factual information on the history and outcomes of the certification program.

Semi-structured interviews were conducted by the lead author between July 2016 and August 2016 with woodlot owners, program managers, and forest managers. In all, 34 interviews were completed with 18 certified and four uncertified forest owners, two EOMF staff (referred herein as MF staff 1 and 2), two provincial government forestry staff associated with the certification program, six forest managers overseeing different landowners, and two representatives of local forestry associations. Among participants, seven were members of the CWG. The program coordinator provided access to the contact numbers of all certified landowners. The landowners were then contacted through phone to arrange for interviews either in person or on the phone. Few of the landowners including the uncertified landowners

were contacted through recommendation by others. Interviews were facilitated by a guide, consisting of open-ended questions and follow-up prompts to gain further understanding of questions. The guide primarily asked participants the history and motivation for participation in the certification program, how certification helps to address the management challenges they face, the benefits they derived and challenges, and future perspectives on certification.

An online questionnaire survey using the Qualtrics Survey Platform was used to solicit information from certified woodlot and members of the CWG in fall 2016. The questionnaire included both closed and open-ended questions and sought to explore the perceptions and experiences of participants in the certification program. The survey was sent to160 participants including 90 currently certified forest owners, 29 members of the certification working group and 41 inactive or former certified woodlot owners. Forty-two responses (33 certified forest owners and 9 members of the CWG) were completed at a rate of 26.3[7] percent. Appendix F shows the socio-demographic background of the survey respondents. The survey data was analysed using SPSS to generate simple descriptive statistics.

All interviews and documents were analysed using NVIVO 11. In NVIVO, relevant themes were coded against the roles described in Table 1 and Figure 2 as well as for emergent themes. Interview data were used to triangulate and supplement the surveys and documents.

## 3.4 Results: The role of the EOMF in the certification of private forests in Eastern Ontario

### 3.4.1 Scoping and program design

Themes that emerged under scoping and program design are: program identification and selection, piloting and program implementation, development of policies and program manual, and creation of governance structures. A majority of these roles were undertaken in the early-phase (0-2 years) of the certification program.

Regarding program selection, program documents showed that the EOMF began discussions in the late 1990's to adopt forest certification as a tool to promote SFM. The discussion was in response to interests shown by stakeholders, especially NIPFOs, in forest certification. The decision to adopt the FSC certification system over other existing systems – e.g., the Canadian Standards Association (CSA) – was informed primarily by two main factors. These

[7] The response rate for the survey in the EOMF in chapter 2 is different from the response rate in chapter 1. This is because in chapter 1, the survey reported findings from both certified and non-certified landowners while in chapter 2, only findings from certified land owners were reported.

were the low cost of FSC's group certification and stakeholders' familiarity with the FSC's Great Lakes-St. Lawrence standard for SFM.

The EOMF began the program by piloting the FSCs regional standards on selected private forests with support from the FSC, forest managers, a private forest company, government agencies, and landowners in early 2000. The pilot which also formed the pre-audit involved taking forest inventory and gap analysis and designing harvesting operations to see the value of certification on selected woodlots. The pilot spatially targeted the Lanark County because of its high forest cover and demonstrable forest harvesting culture as explained by MF staff 1: '*we targeted Lanark county as the pilot area because it's got 55% forest cover, there is good maple and pine over there…and it has a more harvesting culture than we have in the south-eastern'.*

Following the completion of the pilot, the EOMF received an FSC certificate in 2003 to begin full program implementation. In the early phase, the EOMF developed a Program and Policies Manual (PPM) to guide all aspects of the certification. The PPM included a checklist of governance and operating procedures for SFM such as the legal requirements, financial policy, membership rules and dispute resolution, and auditing and reporting procedures. The EOMF obtained financial and technical support from the provincial and federal government to develop the manual. Program managers interviewed considered the PPM as one of the most important early accomplishments of the certification program since it would have been impossible to operate the program without it.

In the early-phase, funding for the program came completely from donors which included private companies, foundations, and government. The donor funds were important because they enabled the EOMF to subsidize the cost of participation, embark on outreach, and reduce private transaction cost, e.g. lack of awareness and knowledge on certification. For instance, the majority of survey participants (Appendix F, Table F.1) and landowner interviewees touted the low-cost of joining the program as an incentive that allowed them to participate. A landowner stated, ''*I was able to get onboard for a very small amount of money, it cost me maybe 50 dollars a year or something…..that was a big motivation for me to grab on to it and join it''.*

As the program took-off, donor support, especially from government, declined significantly affecting the capacity of the EOMF to sustain and reach out to more landowners. To sustain the program in the medium to long-term, the coordinator said they had to '*become more responsible financially and a little more aggressive'* including cultivating new sources of

funding. For instance, the EOMF prioritized the recruitment of the community and private commercial forests which proved to be valuable. MF staff 1 observed that only within the last 5 of the 15 years of the program's existence did they achieve financial self-sufficiency largely through the contribution of community forests. In his words '*let's say the community forests helped to carry the private landowners.'*

The EOMF also created hybrid governance structures to enhance decision making and stakeholder representation. Program documents show that in the early-phase, the EOMF had three levels of governance: a certified landowner group, the coordinator, and a management group called the Certification Working Group (CWG). First, the landowner group, made up of certified landowner members had representation on the CWG. Interviews with some members of the group including the leader showed that the group met periodically for networking, learning and educational workshops on certification often through the support of the coordinator. Second, the coordinator was primarily responsible for landowner recruitment and served as the primary contact of the program on behalf of all participants. All landowners interviewed indicated that the coordinator was knowledgeable and provided leadership, maintained regular and personal contact, and facilitated diverse learning and educational opportunities for members. However, since 2013, the EOMF outsourced the recruitment of new landowners to independent forest managers who are accredited by the EOMF as explained by MF 1:

> *There are many landowners over the map, and the model forest cannot spend the time and money to organise them; it is just too time-consuming. So, one of the things we learnt over time, going forward, we now have accredited forest managers to recruit private landowners directly. So, we have a forest manager with a bunch of clients… it is easier to certify that way.*

The majority of the landowners interviewed indicated that the changes in the coordinator's role reduced the contact time with the program managers and affected the growth and cohesion of the group. A representative of the landowners group further stated, *'I see a diminishing interest on the part of private landowners in certification*'. More so, the representative stated that many landowners belong to other organizations that offer similar support that the EOMF offers and that landowners are concerned about paying additional money to be certified.

Third, the CWG consisted of multi-sector partners including EOMF staff and board members, representatives of landowners, government, and forest industry. According to some members

of the CWG interviewed, the CWG provided a useful technical support group where the EOMF sought specialist skills and strategies to respond to concerns and advance the program. The 2012 audit report showed that the CWG provided expertise or links to experts in preparing silvicultural prescriptions for forestry operations such as those involving High Conservation Forest Values (HCFV), e.g. riparian buffer areas. Moreover, in 2014, a new CWG was created in the south-western regions due to the expansion of the program to that area.

### 3.4.2 Program administration and coordination

The themes that emerged under program administration and coordination are program promotion and landowner recruitment, monitoring and reporting, and capacity building. Most of these roles were undertaken during the take-off phase of the program.

The EOMF undertook several tasks to promote the certification program to attract landowners. First, program managers explained that during the early phase of the program, promotional activities focused on trust building relationships with landowners. The majority of landowners said that the coordinator personally visited their woodlots, participated in landowner group meetings, facilitated educational workshops, and connected them to trusted and professional foresters based on their needs. A certified land owner interviewee touted the role of the coordinator in building trust and meeting landowner needs:

> *I could consider [name] a friend for life because he had such great inter-personal relationships, he was so easy to go with and so knowledgeable. You know, he helped me set up the first timber cut contract and made sure it was done according to my specifications.*

Second, as the EOMF program became well-known and donor funding declined, the EOMF was compelled to explore new strategies to promote and sustain the program. For instance, since 2012, the EOMF has focused on the use of online communication and information tools, and the development of program brochures to reach out to participants. The MF staff 1 explained:

> *We have structured our communications strategy by putting more content online... Now, I do not spend time contacting owners and managers to talk them into it… we have documented it on the web…we have got videos and various resources online to help prospective applicants.*

Despite these efforts, the non-certified landowners contacted indicated varied reasons for not joining the certification program. These ranged from the lack of awareness, limited understanding of the program, availability of other landowner stewardship programs, and the program not being ideal for landowners without a commercial focus. Also, a formerly certified landowner said he opted out because he did not feel being '*certified would ensure the longevity of his forest beyond his ownership of the property*'.

Monitoring and reporting appeared as an important role in the take-off phase. Program documents showed that EOMF used both internal and external monitoring to ensure compliance with guidelines. Internally, the primary responsibility for inspecting and reporting on forests operations rested on program participants, although in practice forest managers were engaged to perform this role. For the private landowners with active operations the EOMF ensures that monitoring is only undertaken yearly. The external audit is the most demanding and is conducted by a third party on select forest properties with active operations both annually and every five years. After every annual audit, a report is issued, and areas that require attention are addressed by the EOMF. For instance, the 2010 audit report requested the EOMF to improve its internal monitoring to accommodate the expansion of program participants. The EOMF responded to this by building an online data management tool to facilitate easy reporting and monitoring.

Documents and interviews showed that the EOMF used the certification to build landowner capacity to meet their needs and interests for SFM. In the survey we administered, the majority of respondents indicated that they were satisfied that certification had increased their access to less costly professional forest monitoring, and education and training and enhanced record keeping on forests (Table 3.2). In the interviews, all the private landowners stated that access to information, education and knowledge and professional forestry services such as financial planning for woodlot management, tree marking and selective harvesting, were the biggest benefit they had gained from the program. According to some of the participants, access to professional forestry services helped to protect landowners from unscrupulous harvesters and held the potential to improve the economic and ecological sustainability of forests. For instance, some certified landowners stated that tree marking and selective harvesting which focuses on removing less economically valuable trees including diseased and dying trees helps to improve the stands of economically valuable tree stocks on their properties and to identify trees of significant ecological value.

In terms of direct market benefit, a little over one-third of participants said they were satisfied certification had improved their access to certified markets or received higher prices for their wood (Table 3.2). However, in the interviews, all the landowners indicated that certification has yet to yield any significant economic returns. For instance, a landowner stated, *I think the economic objective of certification has been less successful; there is no premium price to be gained by certification, at least not now, and I don't know if there will be.* Review of audit reports and confirmed by the program coordinator suggested that the closure or absence of local mills affected the market benefit for certified timber. For instance, Domtar, a private forest company which was a key supporter of the certification program in its inception collapsed in 2005. According to one forest manager Domtar made it easier to promote certification in the region initially because it offered a ready market for '*low value, poor quality wood including beech and some of the ash and pine'*. The 2010 audit report acknowledged the impact of mill closures on the certification program.

> *A serious and common concern of forest managers and the CWG is the closure of mills that purchase low quality material used for the production of pulp, paper and fibreboard. Since 2005 regional mill closures include ATC (MDF) - Pembroke, Domtar (paper), Portage du Fort and GP Flakeboard (fibreboard).....The viability of the EOCFG and the groups involved is closely tied to their success in selling low quality material. The forest industry continues to struggle throughout all eastern Ontario (and beyond) as the market situation remains stagnant for low quality hardwoods.*

The program coordinator further suggested that in other localities where there is a local mill, there is a demand for certification and certified forests are getting additional income. He explained, *in the west where we have certified forest, there is actually a mill paying additional money for certified red-pine. So, we are getting a whole bunch of new clients in the west….because of the mill there…so, I guess it is providing benefits in some markets but not in others.*

Table 3.2 Level of satisfaction with certification program (N=42). Values are in percentages (%)

| | **Completely dissatisfied** | **Somewhat dissatisfied** | **Somewhat satisfied** | **Completely satisfied** | **No-opinion** |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Improved access to information on current forest management practices. | 4.2 | - | 29.2 | 58.3 | 8.3 |
| Enhanced record keeping on forest management. | - | 4.2 | 33.3 | 20.8 | 41.7 |
| Increased access to less costly professional forest monitoring. | | 8.3 | 29.2 | 29.2 | 33.3 |
| Increased access to less costly professional training. | 4.2 | 33.3 | - | 29.2 | 33.3 |
| Enhanced access to the certified wood market. | 4.3 | 8.7 | 34.8 | 8.7 | 43.5 |
| Improved contribution to the preservation of HCFV. | - | 4.2 | 29.2 | 58.3 | 8.3 |
| Higher prices for wood markets. | 4.3 | 8.7 | 26.1 | 8.7 | 52.2 |

### 3.4.3 Networking, representation and mediation

The EOMF performed networking, representation and mediation roles which helped to enhance the experiences of participants. First, the EOMF made it mandatory for program participants to sign onto a government stewardship program called the Managed Forest Tax Incentive Program (MFTIP). The MFTIP is an Ontario government program enabling landowners who get their property classified as 'Managed Forest' to pay 25% of the municipal tax rate set for residential properties. Second, the EOMF networked with government agencies and private corporations to identify program funds. This form of networking was particularly relevant during the early stage of the program.

The EOMF also performed mediating functions largely to respond to stakeholder concerns to promote inclusiveness and resolve disputes. For instance, in 2013 and 2014, the audit report revealed that the EOMF needed to demonstrate its familiarity with available sources of information about all Indigenous communities and their traditional rights within the region of their operation. Although per the certification's PPM private forest owners have no obligation to Indigenous communities, the EOMF made room for a specialist to provide information on the context of Indigenous interests to all forest managers. Also, in the survey, more than one-third and half of the participants indicated that the certification helped to foster collaboration with Indigenous peoples and provided educational opportunities about Indigenous forestry

values, respectively (Table 3.3). The EOMF also helped to resolve conflicts between program participants. In the survey, more than half of participants agreed that program managers were effective in resolving conflicts (Table 3.3).

### 3.4.4 Information, knowledge generation, and exchange

Review of program documents and interviews showed that the EOMF generated and shared knowledge and information on current forest management practices and the certification program to both program participants and the public. For instance, more than half of survey participants indicated that the EOMF improved access to information on current forest management practices (Table 3.2). Also, some of the interview participants stated the EOMF has brought awareness on invasive species and SAR by providing information on how to identify and manage them. Also, the 2011 audit reported that the EOMF established relationships with government, community forest managers and local conservation agencies on how to identify, monitor and regenerate SARs. Moreover, the report noted that individual harvest plans had identified uncommon tree species (e.g., butternut, black cherry, white pine) on their properties that had been prioritised for protection. The audit further revealed that forest managers and tree markers demonstrated capacity to meet the requirement not to harvest acceptable growing stock of tree species that represent less than 10% of the stand so as to encourage the abundance and regeneration of rare or uncommon tree species in the region.

The majority of landowners also stated that the certification program provided a platform for landowners get together to share ideas and learn from each other. A landowner stated:

> *is great being in a group with other people who have the same interest…like every year we do field tours in both Spring and Fall, and we get to see what other people are doing on their properties and think about the best practices that can be implemented – it is a good way for people to learn….. I have also made a really good group of close friends with similar interest which is important to me… it has also enhanced my interaction with forest managers.*

The EOMF also provided opportunities for knowledge exchange between forest managers and landowners with Indigenous communities. Interview participants said that formal workshops on Indigenous communities helped both landowners and forest managers to appreciate other forestry values and learn about some of the sensitive Indigenous issues. The EOMF used

several resource persons including experts working on Indigenous forestry issues to transmit knowledge to members.

Review of program documents showed that in partnership with several organizations in government, the private sector, and other organizations, the EOMF provided information and shared knowledge on certification to the public and guided other organizations to achieve the FSC certification. In this context, the EOMF's information and knowledge sharing activities have focused on: economic and non-economic benefits of certification; how to market certified products; knowledge and awareness of traditional forestry values; and onsite forest visits to inspire and help private woodlot owners to certify. Also, through membership with the International Model Forest Network, the EOMF hosted Model Forest delegations from Nova Scotia and Russia and provided mentoring on how to achieve the FSC group certification.

Table 3.3 Characterization of the nature and operation of the forest certification program (N=42). Values are in percentages (%)

| | **Strongly disagree** | **Disagree** | **Agree** | **Strongly agree** | **No opinion** |
|---|---|---|---|---|---|
| Participating in the forest certification scheme is costly. | 8.8 | 44.1 | 26.5 | 8.8 | 11.8 |
| Participation in the forest certification scheme demonstrates commitment to responsible forest management. | - | 5.9 | 38.2 | 55.9 | - |
| The certification program provides opportunities for education about Aboriginal peoples' forestry values. | 2.9 | 2.9 | 52.9 | 2.9 | 38.2 |
| A lot of time is spent in the documentation to meet the requirements for certification. | 5.9 | 26.5 | 26.5 | 20.6 | 20.6 |
| There is a lack of transparency in forest management contract under the certification scheme. | 8.8 | 41.2 | 5.9 | 2.9 | 41.2 |
| The certification program helps foster collaboration with Aboriginal peoples. | 6.1 | 3.0 | 30.3 | 6.1 | 54.5 |
| The managers of the forest certification scheme are effective in resolving conflicts. | 3.0 | - | 51.5 | 3.0 | 42.4 |

## 3.5. Discussion

### 3.5.1 The role of the EOMF in a group forest certification program

This research revealed three distinct intermediary roles in the implementation of the FMC program for NIPFOs. These are program design and implementation (*early-phase*), routine administrative and organizational work (*take-off phase*), and financial and organizational sustainability (*long-term phase*) (Figure 3.3). In each of these phases, we have highlighted specific intermediary roles that were undertaken by the EOMF. Below, we discuss the roles identified.

First, in the *early-phase* of the program, the EOMF largely focused on building broad institutional support and legitimacy to support program design and implementation (Figure 3.3). Consistent with the suggestion by Neave and Wolthausen (2004), the participation of local stakeholders in certification processes is important to enhance a sense of local "ownership". In our case, the EOMF integrated actors from government, the private sector, and local forestry organizations in program selection, piloting, implementation, and governance structures. These strategies enhanced trust, buy-in and legitimacy from both local and regional actors for the program. Particularly, the inclusion of local forestry groups provided observations and experiences to inform program selection that was consistent with local values and helped to instil a sense of local ownership of the process. Also, the prioritisation of stakeholder integration from both government and the private sector enhanced access to donor funding and technical support for the FMC program.

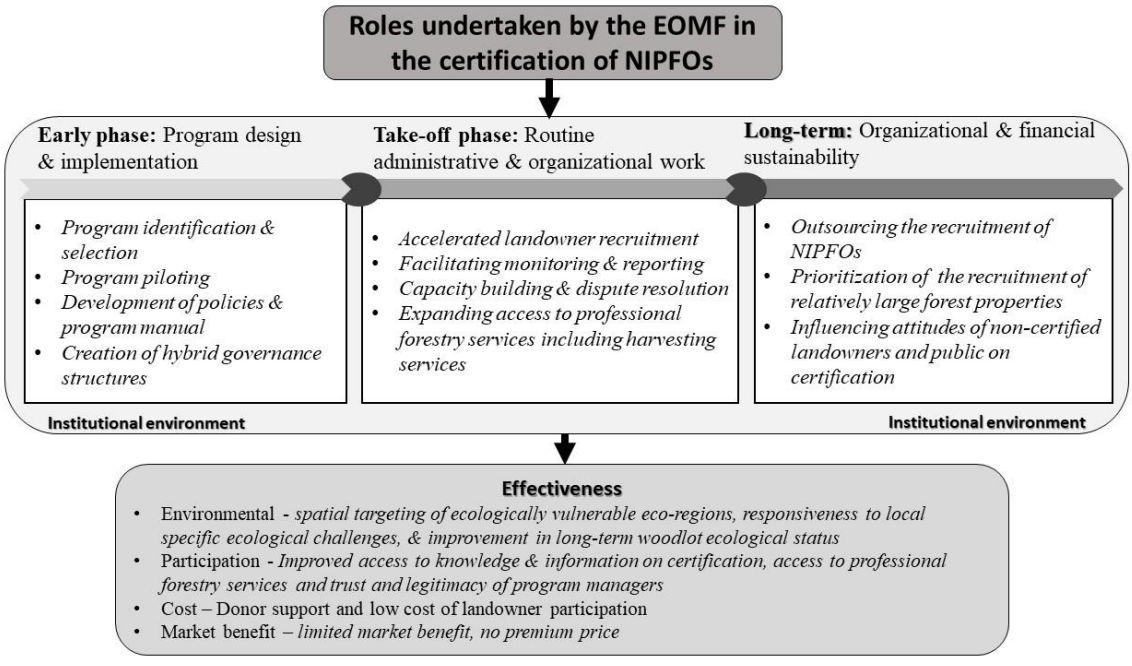



Figure 3.3 Specific roles and effectiveness of EOMF in the certification of NIPFOs

Second, in the *take-off phase*, the EOMF's roles largely focused on routine administrative and organizational work such as landowner recruitment, facilitation of internal and external monitoring and auditing respectively, and capacity building and local need satisfaction(Figure 3.3). In the interviews, participating landowners said that the EOMF directly established and maintained connections with landowners through the provision of personalised forestry services, personal visits to their woodlots, and facilitation of educational workshops. These findings are consistent with the works of Creamer et al. (2014) and Ma et al., (2014) who suggested that access to professional forestry services are important for landowner participation in certification. In our study, provision of professional forestry services enabled the EOMF to build social capital, i.e., trust and networks. Putnam (1993) defines social capital as 'those features of social organizations, such as networks, norms and trust that facilitate coordination and cooperation of mutual benefit' (p. 2). Particularly, networks enabled the EOMF to spread information on the certification, while trust in the EOMF enabled such information to be acknowledged and accepted.

Although the EOMF witnessed significant program expansion – e.g. landscape coverage and membership, it also experienced significant management challenges especially instability in donor funding. Huber-Stearns et al. (2013) have suggested that donor uncertainty affects an intermediary's ability to scale programs at the regional level. In EOMF, funding instability required the organization to adopt innovations to solidify their financial well-being. However, innovations that focused on reducing the cost of maintaining and recruiting landowners affected the EOMF's ability to scale program to target new landowners. Thus, although we agree with Huber-Stearns et al. (2013) that instability affects the scale of operation, this instability can create both opportunities and dilemmas.

Third, to maintain the program in the *long-term*, the EOMF focused on securing the organizational and financial sustainability of the program through cost-saving measures and investments in secured funding sources (Figure 3.3). Some of the cost measures included limiting the coordinator's role to routine administrative duties including organising and responding to audits and outsourcing landowner recruitment to private forest managers. Also, to keep the program financially self-sustaining, the EOMF broadened participation to include relatively large forest properties who could pay to keep the program going.

Finally, across all phases of program implementation, the resources, knowledge and skills derived from the CWG and the program coordinator were significant in enhancing smooth program implementation. The CWG played a critical role in the provision of technical skills

and access to supporting resources to maintain the certificate. The program coordinator also provided technical and managerial expertise to moderate and leverage the interests, resources and knowledge base of all stakeholders. This finding is consistent with those who have examined knowledge exchange between academics and practitioners in other resource management sectors (e.g., Fazey et al., 2013). While other researches have focused on facilitators who support successful collaboration between different types of knowledge holders (Reed and Abernethy 2017; Brundiers et al., 2013), our research confirms the importance of this role for the success of long-term partnerships and programs involving a range of community, industry and governmental actors. Also, the certification program built on the established administrative structure and networks and trust that the EOMF had built with stakeholders from government, local forestry groups, and foresters. This helped to run the certification program at a relatively lower cost. Hence, Putnam's (1993) observations about the role of social capital has both social and economic benefits.

### 3.5.2 Implications of the EOMF's role to achieving effectiveness

The analysis of the role of the EOMF in the certification of NIPFOs has broadened the understanding of how certification can be used to enhance landowner's needs, interests and preferences and to support broader conservation objectives.

First, the EOMF directed certification to NIPFOs in eastern Ontario so as to address locally identified forest management challenges as well as improve the governance of private forests at the landscape-level. In eastern Ontario, the management of woodlots is threatened by the lack of education and access to professional forestry services by owners, agricultural expansion, and spread of diseases (EOMF, 2016a). As an important stakeholder in eastern Ontario, the EOMF facilitated the FMC program as a way to address local social-ecological forest management challenges. Specifically, the EOMF used the certification to meet the needs, interests and preferences of local actors for services such as networking, access to educational and learning opportunities, and professional forestry services (Figure 3). In addition, the certification incorporated the management of local-specific ecological issues such as invasive species, SAR and other forest pathogens. Particularly, the collaboration and consultation with governmental and local conservation agencies to identify and compile, protect, monitor and support the regeneration of SARs contributes to broader landscape management of private woodlots. Thus, through certification, the EOMF gathered landscape

ecological knowledge relative to woodlot owners and thereby, helping in their coordinated management.

Second, in all phases of the certification program, the survey and interview findings confirmed that the EOMF helped to enhance the participation of woodlot owners in certification by reducing the cost of accessing and maintaining a certificate through the group certification option and donor support (Davis et al., 2015; Crow and Danks, 2012), and access to forest professional forestry services (Ma et al., 2012). Particularly, access to early donor funding enabled program managers to embark on outreach, experiment with certification and demonstrate its applicability on private land. Also, the landowners averred that access to professional forestry services such as professional logging contracts, selective harvesting and tree marking enhanced their management effectiveness to preserve economically and ecologically valuable tree stocks. Thus, despite the lack of immediate financial benefits, the participants anticipated long-term economic and ecological benefits from certification. In addition, the trust and legitimacy of program managers, particularly the coordinator, and the established administrative structure, networks and trust of the EOMF enhanced participation and cost effectievness of the certification program. In the early-phase, the landowners valued the fact that the coordinator of the EOMF reached out to them individually and in groups with information and knowledge on certification. Also, the firmly established adminsitrative and network structure of the EOMF made it easy and less costly to assemble forestry experts to provide technical guidance in preparing the primary documentation and management oversight of the certification program. Thus, the EOMF did not only bridge the lack of information and knowledge on certification for NIPFOs by reducing private search and information gathering processes but provided it at a relatively low cost.

Fourth, the capacity of the EOMF to adapt to declining funding sources through the recruitment of community forestry enterprises, use of private forest managers as principal contacts for the recruitment of NIPFOs, and investments in online sources of communication and information improved the organizational and cost effectiveness of the program. However, woodlot owners are concerned that the renewed focus to sign relatively large property forest owners has limited the EOMFs effort to target small landowners. It is therefore not surprising that beyond the early adopters, the extent of new landowner entrants into the program has slowed down.

Fifth and finally, the role of the EOMF in promoting the market benefit of certification appears limited because of broader socio-economic challenges such as the collapse of local

mills. The lack of market benefit, especially price premiums for landowners is consistent with other studies focusing on small-holder certification (see Crow and Danks, 2012; Wyatt and Bourgoin, 2010). Thus, innovations are needed to improve market benefit for certified landowners in the EOMFs certification program. Below, we discuss some policy innovations to improve the benefits of certification at the local level.

### 3.6 Conclusion and policy recommendations

This study has contributed to improving understanding of how and under what conditions intermediary organizations enhance the effective participation of small-scale forest actors in forest certification. Our approach focused on understanding how different program phases condition the kind of roles performed by intermediaries and the implications for achieving effectiveness. Applying this to our case study enabled us to identify specific intermediary roles that reduced barriers to landowner participation, improved the benefits of certification for the landowners, and achieved broader landscape-level conservation benefits. Throughout our analysis, the key attributes of the EOMF that enabled it to perform effectively were its ability to: (a) build social capital and run the certification at relatively low cost, (b) provide specialized locally relevant forestry services required by landowners, and (c) adapt and innovate to address program changes and stakeholder demands, particularly in the medium to long-term phases. Despite these, the low market benefits and administrative and organizational changes to adapt to funding challenges limits the continued participation of private landowners in the certification program.

To sustain interests and improve landowner participation in the certification program, addressing questions of long-term funding and improved market benefits are critical. First, although the lack of sustained donor support, especially from governments, affected the stability of the certification program to target small-scale foresters, external support, particularly from government needs to be encouraged. Wyatt and Bourgoin (2010) suggested that in Canada, woodlot owners are often cautious of government regulation. However, as our findings showed, certification is attractive to some landowners and also offered several conservation benefits. For instance, certification improved knowledge and the coordinated management of complex ecological challenges such as SARs, HCFVs, and invasive species on private lands. Thus, government involvement in certification needs to be encouraged because of the larger conservation benefits to be derived on private land. Particularly,

government support is needed to increase knowledge and information on forest certification and provide technical guidance to reduce cost to landowners.

Second, consistent with other studies, improving market benefit of certification remains an important concern for small-holder landowners (e.g., Davis et al., 2014; Crow and Danks, 2012). In the US where small-holder certification resulted in some market benefits (see Crow and Danks, 2012), the role of local institutional buyers such as schools, public sector organizations, and value-added product lines were critical. Thus, facilitating organizations such as the EOMF can lobby governments to use its procurement policies to promote certified wood from small-holder suppliers.

Third and finally, even without clear economic benefit, certification is still attractive to certain segment of landowners for its value alignment, educational, social and indirect economic benefit. Hence, for some actors, highlighting the conservation benefits of certification can be more attractive (Ma et al., 2012). These findings question the objectively defined rhetoric that market incentives will promote sustainable management. Future research needs to examine how facilitating organizations such as the EOMF can attract more landowners beyond early adopters including those with poor management practices and economically-oriented actors, who may be less likely to opt for certification.

## PREFACE TO CHAPTER 4 - LINKING FOREST VALUES, ECOSYSTEM SERVICES AND HUMAN WELL-BEING THROUGH A CAPABILITIES APPROACH – EVIDENCE FROM MODEL FORESTS IN JAPAN AND CANADA

The previous two chapters provided evidence about how bridging/intermediary organizations, i.e. Model Forest organizations, within specific socio-ecological and institutional contexts, align private-social partnership arrangements with specific social contexts and as well improve the effective participation of local actors in such governance arrangements. While both chapters improved understanding of how BOs or intermediaries facilitate the effective implementation of different kinds of private-social partnership arrangements at the local level, it is not clear how these governance arrangements improve local dimensions of well-being linked to local ecosystem services. Specifically, how improvements in governance effectiveness can translate into valued outcomes that benefit diverse local actors remains unclear. In the next chapter, I demonstrate how local dimensions of well-being of small-scale forest actors can be improved through participation in MFs as voluntary collective social institutions. Specifically, I highlight how MF governance platforms can also serve as collective social institutions that create opportunities and freedoms for small-scale forest actors to improve their well-being. First, I argue that since MF landscapes embody diverse actors, it is important to identify these actors and their values relative to forests. Second, I examine how belonging to an MF expanded the opportunities and freedoms of the actors to pursue the values they have reason for. Using cases from both the EOMF and KMFA, the chapter draws on concepts of forest values, ecosystem services, and capabilities to improve understandings of how the well-being of small-scale forest actors can be improved and the implications for the governance of small-scale forest landscapes.

# CHAPTER 4 - LINKING FOREST VALUES, ECOSYSTEM SERVICES AND HUMAN WELL-BEING THROUGH A CAPABILITIES APPROACH – EVIDENCE FROM MODEL FORESTS IN JAPAN AND CANADA


## Abstract

Many small-scale forest communities in the post-industrial world are characterised by complex socioecological changes such as increasing diversification of forest owners and forest values, ageing of forest owners and workers, and changes in risks in ecosystem management. These changes affect local ecosystem management capacity and the benefits derived from the forest. Yet, few governance interventions have successfully been implemented to address these challenges. Through the Capability Approach (CA), this research examined how the generation of collective capabilities through the Model Forest (MF) concept can help create opportunities and freedoms to improve local ecosystem management capacity and the well-being of small-scale forest actors. To achieve these, the roles of two MF organizations, the Eastern Ontario Model Forest, Canada and the Kyoto Model Forest Association, Japan, both with a similar focus on small-scale forest landowners or forest managers were examined using a mixed-method approach involving qualitative and quantitative strategies. Our findings showed that both MFs used different institutional arrangements to improve the capability set of actors relative to four categories: livelihoods and activities; knowledge and technology; relationships building and coordination; and freedom and voice. Collectively, these capabilities improved the functioning of the actors, particularly to pursue shared values for forest management and conservation and to improve local ecosystem benefits from the forest. Our study demonstrates that a CA analysis with a focus on MFs is helpful in revealing the positive influence of landscape-level voluntary governance arrangements in improving human-ecosystem relationships.

## 4.1 Introduction

Globally, the need to secure the ecosystem functioning of forests and improve the well-being of forest-dependent communities remains an important research and policy priority. Across many regions in the post-industrial world such as Europe, North America and some countries in Asia, such as Japan, changes in forest values from timber production to conservation, recreational, and aesthetic values (Wiersum et al., 2005; Nordlund and Westin, 2015; Côté et al., 2017) have raised questions about how to establish governance processes for sustainability (Daw et al., 2011; Bennett et al., 2015). Particularly, among small-scale foresters – including family forest or Non-industrial Private Forest Owners (NIPFOs) – future projections suggest that as the proportion of new owners diversify to include women, urbanized, young, and professional and highly educated actors (Nordlund and Westin, 2011; Côté et al., 2017), the share of forest owners oriented towards a wider set of socio-environmental values will grow (Häyrinen et al., 2015). Increases in multiple forest actors and values not only suggest shifts in people-forest relationships and their influence on human well-being, but also, re-echo concerns over how ecosystem services (ESS) can be governed sustainably, efficiently and equitably (Dawson and Martin, 2015).

Although research on ESS governance has advanced substantially over the past decades, some researchers argue that knowledge about how to govern ecosystems and the associated benefits remains unsatisfactory (Daw et al., 2011; Bennet et al. 2015). Bennett et al. (2015), particularly reiterate that how and when existing governance structures limit or augment sustainable, equitably and efficient flows and benefits of ecosystems across different stakeholders are not well understood. Dawson and Martin (2015), and Bennett et al. (2015) suggest that to enhance ESS governance, there is the need to recognise: the plurality of ways ESS are valued; multiple interests and values within and between groups that benefit from ecosystems; power relations surrounding ecosystem uses; and changes in risks and uncertainty in ecosystem management. Relating these broader ecosystem governance issues to the management of small-scale forests in the global north, two key issues arise. First, as small-scale forest owners, their values and objectives for managing forests become more diverse, it is imperative to improve governance arrangements to embrace the multiple ways ESS are valued (Dawson and Martin, 2015). However, in many regions, most forestry organizations often perceive socio-cultural values, often prioritized by NIPFOs, as difficult to govern (Boström, 2012) and consequently, they do not typically cover them as part of their mandate (Häyrinen et al., 2015). Second, forests, including small-scale forests are often under persistent threat from broader ecological risks (Fischer, 2018), – including fire, invasive

species, climate change. These in addition to socio-economic pressures (Schmithu¨sen and Hirsch, 2010; Neave and Wolthausen, 2004) – such as ownership fragmentation, loss of markets for local logs, and ageing of forestry workers and forest owners – can disrupt social practices that promote collective capacity to respond to risks and challenges at the local-level (Nordlund and Kristen, 2010; Takeuchi et a., 2016). Furthermore, because the majority of the persistent threats to forests operate at larger spatial scales, addressing them requires management solutions at the landscape-level (Fischer, 2018). Yet, few institutional interventions have effectively been developed and implemented to address the complex social and ecological challenges that affect small-scale foresters (Laven et al., 2012; Fischer, 2018).

In this paper, we argue that voluntary landscape-level organizations, such as Model Forests (MF), can serve as a catalyst to generate capabilities that improve the social capacity to manage ecosystems effectively in forest communities experiencing reduced capacity for ecosystem management. MFs are voluntary landscape-level organizations designed to establish partnerships and collaboration among participatory actor groups to solve a wide range of issues related to the implementation of sustainable forest management (Elbakidze et al., 2010). Drawing on the capabilities approach (CA), specifically collective capabilities, we argue that participation in an MF provides opportunities and instrumental freedoms that enable small-scale forest actors to improve their agency and lead the lives they have reason for, which would be impossible if each actor acted alone. To demonstrate this, we learn from the activities of the Eastern Ontario Model Forest (EOMF) in Canada and the Kyoto Model Forest Association (KMFA) in Japan who work with small-scale forest managers and owners. Our analysis is focused on the MF as an example of collective action designed to advance the capabilities of participating actors to improve their relationship with and the benefits derived from forest ecosystems.

### 4.2 Theory: understanding ecosystem services contribution to human well-being through a capability lens

The Millennium Ecosystem Assessment (MA) pioneered the first comprehensive and multi-dimensional understanding of ESS contribution to human well-being. The MA defined ESS as the benefits people obtain from ecosystems. From this anthropocentric standpoint, the MA developed a framework that identified and linked (at different levels), four main ESS including provisioning, regulating, cultural and supporting services (MA, 2003) to five main

well-being constituents, respectively. These well-being constituents are security, basic material for good life, health, good social relations, and freedom of choice and action.

Despite the pioneering work of the MA, the MA framework has been criticised on many fronts. Most notable, Polischuk and Rauschmayer (2012) argued that the MA lacks a clear elaboration of the linkages between the various dimensions of well-being; the interrelations between well-being and ES; and how ES translates into human well-being. For instance, the MA neither accounts for the individual ways people convert ES into factors of personal well-being nor how context shapes how people convert ES to well-being. To overcome these limitations, some authors have proposed the CA as a more comprehensive approach to examining ES contribution to human well-being (see Polischuk and Rauschmayer 2012; Fritz-Vietta, 2016; Breslow et. al., 2016).

Pioneered by Sen (1999), the CA argues that the opportunity to live a 'good life' rather than the accumulation of resources form the core of one's well-being. The 'good life' consists of functionings (beings and doings) that one has reason to value (e.g., being nourished), and capabilities, the freedom to achieve those functionings (e.g., being able to access food). Thus, from a CA perspective, ES do not necessarily translate into well-being but tends to be mediated by specific conversion factors which could be personal, social and environmental (Polischuk and Rauschmayer, 2012). However, many CA studies tend to focus on the individual-level conversion factors while the role of collective institutions in solidifying agency and common values with individual capabilities are less studied (Ibrahim, 2006; Robeyns, 2005). According to Nussbaum (2003), combining one's internal capabilities with the right external environment can generate functioning that one chooses. As a result, some researchers have called for more studies on how collective capabilities are produced and how they affect well-being (Griewal and Rauschmayer, 2014; Pelenc et al., 2015).

Taking a cue from the above debates and focusing specifically on the individual–group interactions that the CA needs to consider, we examine how MFs serve as a collective action space to enhance the functioning and capabilities of small-scale foresters. Our main argument is that since small-scale foresters often suffer from limitations on their agency (i.e., to pursue their perception of a good as in goods and services), as a result of broader socio-ecological challenges (see section 1 and 2.2), the role of collective agency (i.e., the capacity of a group to define common goals and the freedom to act (Pelenc et al. 2015) could be crucial to expanding their freedoms, choices and capabilities (cf. Ibrahim 2006; Tiwari and Ibrahim, 2012). Collective capabilities are the opportunities available to a group to achieve a set of

functionings that each individual alone would not be able to achieve (Pelenc et al., 2016). Some studies have shown that organized collectivities such as voluntary organizations, are fundamental to people's capabilities to choose the lives they have reason to value (Ibrahim, 2006; Pelenc et al., 2015) and provide an arena for formulating shared values and the instruments for pursuing them (Evans, 2002). Thus, organized collectives can generate social conversion factors (e.g., access to social networks, education etc.) to improve functionings of a social-ecological system (Polischuk and Rauschmayer, 2012).

Figure 4.1 shows our analytical framework relating how collective social institutions help to translate forest ES into different components of well-being through improved functionings. We describe an MF as a collective action space that enables participants to draw on diverse capability sets (Table 4.1), particularly the instrumental freedoms to convert forest ES into achieved functionings. The key characteristics of an MF such as networks and partnerships, information, knowledge sharing and experimentation (see section 2.1) are critical to the development of diverse capability sets that actors can draw on. Figure 4.2 shows a list of capability sets relevant to enhancing the functioning of people based on the literature. However, since small-scale foresters are diverse, the type of improved functioning would depend on what one defines as valuable (Figure 4.1). Thus, forest values are critical to one's well-being as they tend to determine the set of capabilities one can draw on and the related acheived functionings (Figure 4.1).

Forest values are the beliefs that represent an individual's orientation toward forests. Forest values can be categorized into three namely ecological, production, and socio-cultural although these tend to relate to each other, making forest values multi-dimensional (Eriksson et al., 2015; Fritz-Vietta, 2016). Production and socio-cultural values tend to satisfy human needs (Erickson et la., 2015) – the material (e.g., timber and fuel) and immaterial (e.g., recreation). Ecological values focus on the intrinsic value of the forests in its own right e.g., preservation of plant and animals species (Erickson et la., 2015).

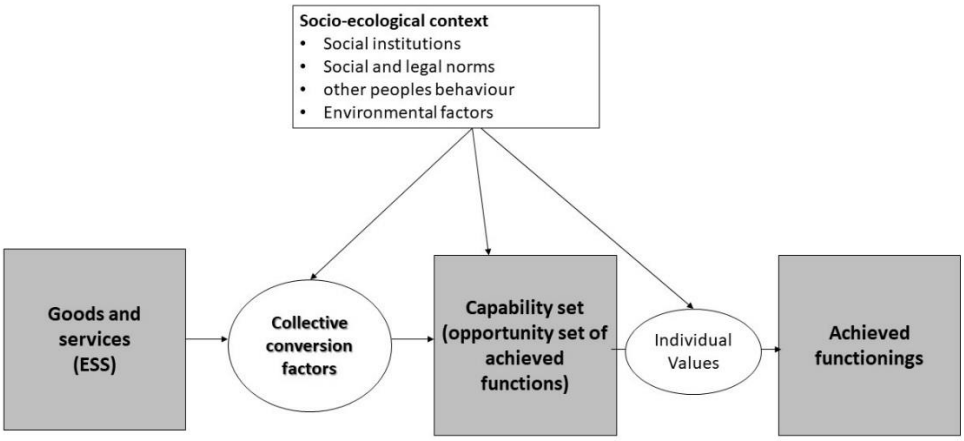



Figure 4.1 Relationships between forest ES, collective conversion factors, and achieved functionings

Based on Robeyns, 2005

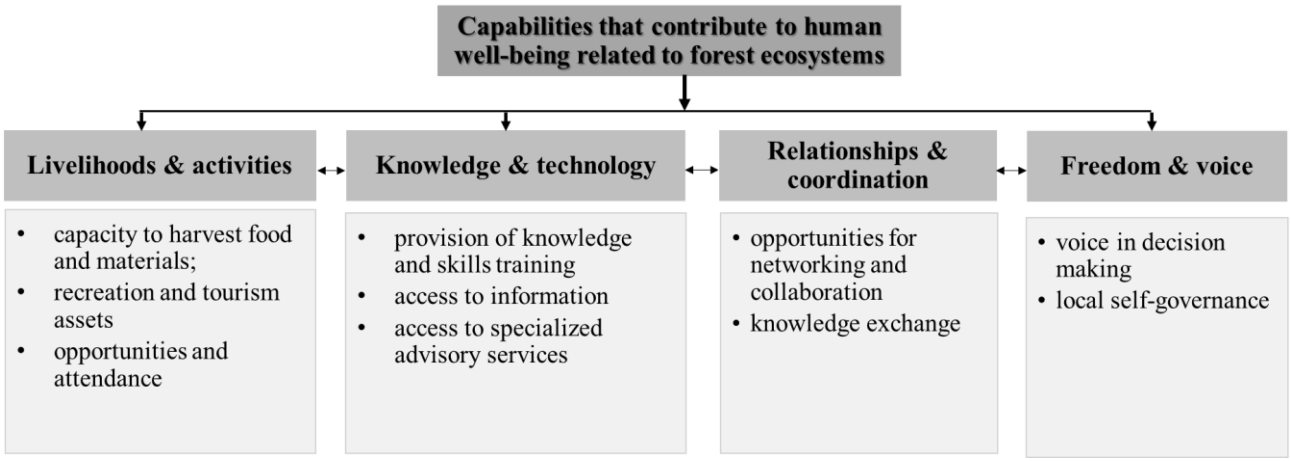



Figure 4.2 Capability sets relevant to forest-people relationships

Source: Derived from Fritz-Vietta (2016) and Breslow et al., (2016).

## 4.3 Context and Methods

### 4.3.1 Model Forests, collective capabilities, and well-being

The MF concept was first developed in Canada in the early 1990s to test new ideas and develop innovations related to sustainable forest management (SFM). Globally, there are over 60 MFs covering 84 million hectares in 31 countries (IMFN, 2018). In practice, MFs function as non-profit organizations that build voluntary and inclusive partnerships among forestry-related stakeholders such as communities, government and private organizations to support

the sustainability of forest landscapes (IMFN, 2018). Thus, MFs can act as forums to build the collective capabilities of actors through a sense of affiliation, networking, collaboration and knowledge sharing among multiple stakeholders to improve the sustainability of forest landscapes. Jastremski (2018) undertook a review of MF studies conducted in Canada and found that MFs have helped to meet diverse local-level sustainability challenges by fostering diverse partnerships within and outside MF structures, facilitating shared knowledge; and building community capacities with tools to take up new opportunities. At the international level, research has also shown that MF initiatives provide: promising approaches to multi-stakeholder collaboration (Boakye-Danquah et al., 2018), particularly to enhance problem solving and analytical deliberation (Elbakidze et al., 2010), and build awareness on the need to cooperate with all stakeholders (Ulybina, 2015).

However, a critical review of most MF studies shows that while MFs have broadly contributed to the practical implementation of SFM on the ground, there is lack of knowledge related to how MFs generate local ecological, economic and socio-cultural well-being. This is because most MF studies focus on the organizational design, evolution, and governance structures and functioning of MFs (see Ulybina, 2015; Parkins et al., 2016; George and Reed, 2017). Hence, studies documenting on-the-ground contributions of MFs to either ecological, economic and socio-cultural outcomes are few (cf. Elbakidze et al., 2010).

To evaluate outcomes on the ground, Elbadkidze et al. (2010) suggested the need to examine stakeholder perceived results and how MF initiatives achieve results. Thus, our research, focusing on how the EOMF and KMFA generate capabilities to improve local dimensions of well-being contributes to understanding local-level SFM outcomes of MFs. The selection of the EOMF and KMFA was influenced by the fact that, compared with the majority of MFs in the global north, both the EOMF and KMFA have small-scale forest producers as key stakeholders (Table 2). In the next sections, we describe further each of the MFs, paying particular attention to the program of activity of interests

### 4.3.2 Study regions

Table 4.1 describes the characteristics of both the EOMF and KMFA. Both MFs rely on small-scale forest producers, have similar interest, and operate as multi-stakeholder organizations. For the purpose of this research, we focused on examining specific instruments adopted by each MF to address place-specific challenges and to achieve specific functionings for specific actors or individuals.

In Ontario, we focused on the EOMF's application of Forest Stewardship Council's (FSC) group forest management certification program as a tool to enhance the sustainable management of private woodlots (EOMF, 2018). The program has a membership of 114 non-industrial private woodlot members with a combined forest of 10,466 ha. The certification program draws support, particularly, resources from government, conservation authorities, local forestry associations, and the private sector. In this study, we selected participants from woodlot owners involved in the certification program.

In Kyoto, we focused on the KMFA's forest conservation program involving mobilization of urban residents, government agencies, academics, and private corporations (through their Corporate Social Responsibility) to support the management of abandoned forests in rural communities. As of March 2016, there were 43 forest management groups involved in this program with agreements in 41 locations.

Table 4.1 Socio-economic variables of relevance to the EOMF and KMFA

| Characteristics | Study regions | |
|---|---|---|
| | EOMF | KMFA |
| Management structure | A board, administrative staff and specialized project adhoc-committees | A board, administrative staff and specialized program committees |
| Location | Great Lakes-St. Lawrence Forest Region, Canada. | Kyoto Prefecture, Japan |
| Socio-ecological status | High reliance on traditional economic forest benefits, e.g., timber, wood fuel maple syrup production, and recreational activities (Holmes et al., 2002). | Little reliance on traditional forest products. Forest are valued for their cultural and environmental importance (Iwai, 2002). |
| Forest size & Ownership | Predominantly small-scale (10 to 100 hectares) private forest ownership. | Predominantly small-scale (10 hectares average) private and family forest ownership. |
| Forest management challenges of concern | Lack of technical knowledge and skills in forest management operations; risks of invasive species (e.g. glossy buckthorn (*Rhamnus cathartica*,) and Garlic Mustard (*Alliara petiolata*) and species | Forest abandonment or underutilization (Takeuchi et al., 2016), wildlife damage, forest pathogens, reduced forest biodiversity, reduced environmental |

| | | |
|---|---|---|
| | at risks (e.g., Butternut (*Juglans cinerea*), and monarch butterfly (*Danaus plexippus*); lack of markets access for local logs and forest fragmentation (EOMF, 2018). | functions of forests e.g., erosion and landslide control. |
| Institutional setting | Market instruments and public-private arrangements. | Predominantly state control by local governments |

### 4.3.4 Methods and Materials

We used a variety of methods involving document analysis, semi-structured interviews, and a survey questionnaire to examine the relationships between actors and forest ES and the MF organizations.

Primary research was conducted by the first author between January and March 2016 in Kyoto and July 2016 and August 2016 in Eastern Ontario. Forty-three semi-structured interviews were conducted: KMFA (n=14) and EOMF (n=29). In the KMFA, two administrative staff, five representatives of private corporations and local volunteer group leaders each, and two municipal forestry officials were interviewed. In Eastern Ontario, twenty-two landowners, two MF staff, two government officials associated with the EOMF and three forest managers were interviewed. The majority of the interviews were conducted face-to-face, except in the EOMF where a few of the landowners were interviewed on the telephone. In interviews, we asked participants about the forest values they held and how membership of the MFs helps to achieve these values.

In addition to the personal interviews, in Kyoto, two separate group interviews were organized with two forest volunteer groups to understand the activities undertaken by participants and how the KMFA helps to meet their needs. The first group interview was organized with 12 male participants from Nagaoka city. Among the participants, 11 were members of the group while the remainder was the leader. In the second group interview, five male participants (three leaders of different volunteer groups and two members of one volunteer group) from the Nishiyama area attended the meeting. Participants in the group interviews had between five to more than 10 years of forest volunteer experience.

We also used an online survey questionnaire to derive information from participants on their level of satisfaction with the capability functions of both MFs. The questionnaire included both closed and open-ended questions. In Kyoto, we sent the survey to 148 respondents –

including private corporations (41), forest activity groups (80), and local governments (27). At the end of the survey period, we received forty-one completed questionnaires (response rate of 27.7 percent). We translated the responses from Japanese to English before analysis. In Eastern Ontario, the survey was sent to 160 participants including 90 currently certified forest owners, 29 members of the certification working group and 41 inactive or former certified woodlot owners. At the end of the survey, 66 completed responses were received which translate into a response rate of 41.3 percent. In Appendices A – Table A.1 and A.2 – we show the socio-demographic characteristics of the survey participants in the KMFA and EOMF respectively. In both MFs, the majority of the participants were men (95.1% in the KMFA and 83.3% in the EOMF).

Also, in the KMFA, we reviewed the forest management goals of the 43 forest management groups. Since each forest management goal is jointly developed by all participating actors of the agreement, the forest management goal was deeemed to be representive of the forest values held by actors. In the EOMF, we also reviewed the public summary of the annual report of the certification program issued by external auditors.

Finally, we audio-recorded all interviews (except where permission was not given) and transcribed them as nearly the same as possible. We used NVIVO 11 for interview data analysis, and we focused on identifying themes related to the objectives of the study, and emergent issues raised by the sources. We used the interview data to triangulate and supplement the survey results and documents.

## 4.4 Results

### 4.4.1 Forest values prioritized by study participants

Forests in both MFs provide multiple values or utilities to participants including production, ecological and socio-cultural values. In the EOMF, the survey results showed that the majority of participants associated their forest with mixed values including ecological, production and socio-cultural (Figure 4.4). Under ecological values, all the participants identified biodiversity conservation (100%) and protection of water resources (93.7%). Regarding production values, the majority (about 68 %) of participants identified firewood and non-timber forest products (e.g., berry picking and maple syrup) compared to timber production which accounted for about 41%. On socio-cultural values, the dominant activities identified by survey participants were wildlife watching, hiking, and sports and entertainment.

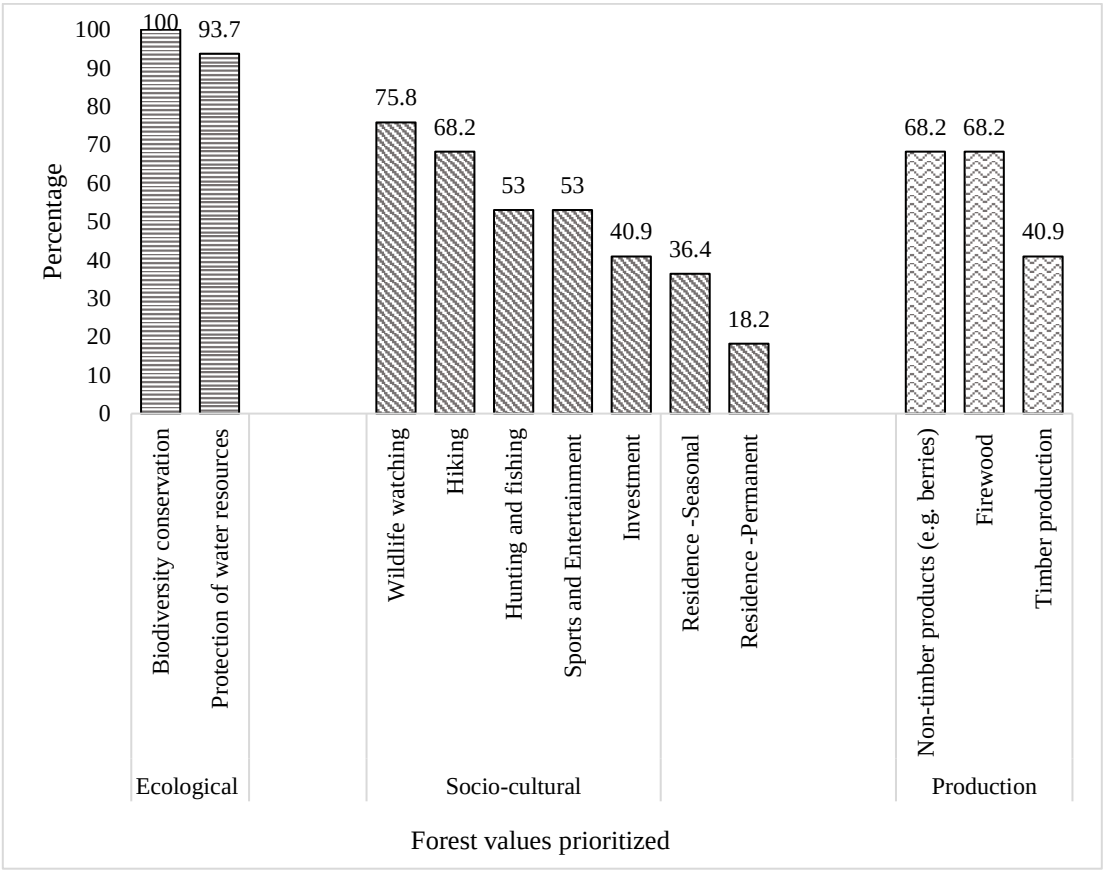



Figure 4.3 Importance of different aspects of forest ownership in the EOMF

Source: Survey Findings, 2016. *N=64. The total exceeds 100% because of multiple responses

In the KMFA, we reviewed the forest management goals and objectives of 43 forest management groups based on data collected from the KMFA website to derive the forest values prioritized by the groups. The majority of the group's goals focused on ecological and socio-cultural values (Figure 4.5). Ecologically, the majority of the group's goals focused on conservation purposes – woodland and bamboo conservation. Socio-cultural values were mainly related to recreational and environmental learning. Finally, a small percentage of the group's goals, less than 10%, focused on production values.

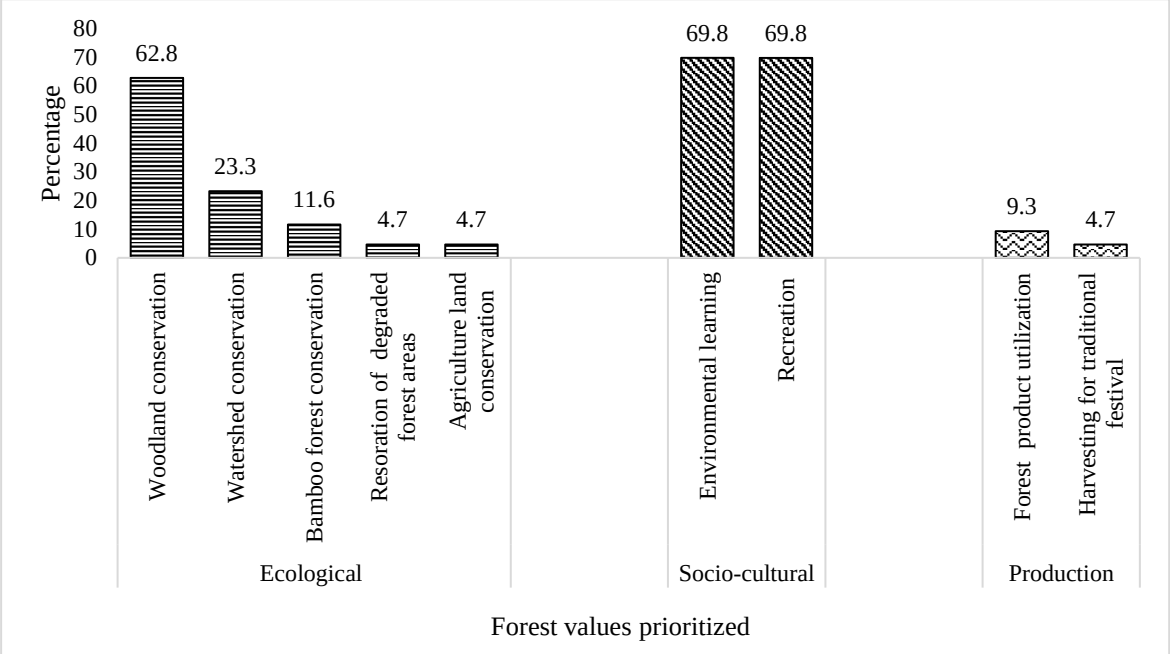



Figure 4.4 Diversity of forest utilities or values reported by forest management groups in the KMFA

* N=43. The total exceeds 100% because of multiple responses

Further statistical analysis using a clustering method confirmed that in both the EOMF and KMFA, participants prioritized multiple forest values (Table 4.2). Based on the dendrogram from H-cluster two value clusters emerged in both MFs. The first cluster included participants (more than two-thirds) who prioritized all three values while the second cluster included participants who prioritized only ecological and socio-cultural values – about 27% and 11% in EOMF and KMFA respectively. Additional chi-square analysis showed that a significantly high number of respondents prioritized all three values in both cases (Table 4.2).

Table 4.2 Cluster Analysis on forest values prioritized by participants.[8]

| | | | | **Cluster Results (%)** | | |
|---|---|---|---|---|---|---|
| | Ecological (a) (%) | Production (b) (%) | Socio-cultural (c) (%) | Cluster 1 (a + b + c) | Cluster 2 (a+c) | Chi-sq. Test* |
| *EOMF* | 100 | 72.4 | 84.8 | 72.7 | 27.3 | 13.636[a] (P= 0.000) |

[8] The Hierarchical Cluster Analysis attempts to identify relatively homogeneous groups of cases based on selected characteristics, using an algorithm that starts with each case in a separate cluster and combines clusters until only one is left.

| | | | | | | |
|---|---|---|---|---|---|---|
| *KMFA* | 97.7 | 11.6 | 81.4 | 88.4 | 11.6 | 25.326[b] (P=0.000) |

[a]0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 33.0.

[b]0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 21.5.

Also, the interviews revealed a nuanced understanding of the existing forest values in both MFs (Tables 4.3 and 4.4). In the EOMF, the majority of interview participants stated that their forests provide production and ecological and socio-cultural values (Table 4.3). In addition, all the interviewed participants emphasized that all forms of forest utilization are carried out in a manner that preserved the ecological and aesthetic values of the forests for now and the future. A landowner summarized the mixed values of his property when he stated,

> *I mostly want to keep it as a forest with all streams, drumlins, habitat for animals…. But there will be some harvesting….right now, a lot of the trees are kind of early successional species and I would like to encourage some mature species… so, it will be a working forest and with places to have trails and stuff like that [EOMF]*.

Table 4.3 Summary of forest values among participants in the EOMF.

| **Values** | **Description of values** | **Representative quote** |
|---|---|---|
| Socio-cultural | Outdoor educational purposes, especially for students; trails and sites for hiking and cross-country; nature viewing; investment and physical activity exercise. | *My extended family and friends continue to spend considerable recreational time at the property. With the waterfront and adjacent woodlot, we have nature appreciation, especially wildlife, wild flowers and panoramic views from the cliffs…... Thus, the flora, fauna, waterfront and visual landscape will continue to be protected and roads and trails maintained for hiking and jogging [EOMF]*. |
| Ecological | Habitat for diverse plant, wildlife, and bird species; and with ponds and streams for moisture retention, and water purification. | *The property is connected via a series of wetlands serving beavers and ducks up-stream and downstream…. it serves as a natural corridor for white tail deer and other animals and I think the birds enjoy the mixed hardwoods areas. There is a drumlin that soaks a lot of moisture and shelters surrounding fields' [EOMF]*. |
| Production | Timber; wild mushroom and berry picking; firewood for | *I do some harvesting occasionally, but the purpose is for stand improvement [EOMF]*. |

| | | |
|---|---|---|
| | market and home heating; balsam fir for Christmas trees; and maple syrup and apiaries production. | |

In the KMFA, the group and individual interviews identified mainly ecological and socio-cultural forest values, although different groups prioritized different aspects of both values (Table 4.4).

Table 4.4 Summary of forest values among participants in the KMFA.

| **Values** | **Description of values** | **Representative quote** |
|---|---|---|
| Socio-cultural | *Private corporations:* sites for fun and learning, educating children about nature, relaxing the mind, improving physical fitness, and experiencing local culture.<br><br>*Forest volunteers:* sites for networking, maintaining spiritual connection and improving physical health.<br><br>*Citizen groups:* connect with urban people; build the interest of young people in the environment; honour the ecological contributions of ancestors and connect to the past. | *It's nice and relaxing to be out in the forest…we get to have fun and eat healthy food…in our last event, we eat rice balls and vegetables using local rice and vegetables….the children worked with branches of trees and acorn pots, hide in the cypress and climbed the mountain; the adults made bamboo flute, bamboo dragonfly, and flower bowls [KMFA].*<br><br>*My grandfather planted the cedar tree in this village up to the top of the mountain…. the forest provided a lot of grace, such as good landscapes, mushrooms, and clean water. Now, the relationship between people and forest is lost…but we cannot leave the legacies of our ancestors…I want to be involved in protecting our ancestral legacies and securing the forest for the next generation [KMFA].* |
| Ecological | *All participants:* underground water recharge; habitats for plant and animals; and for landslide control. | *We are motivated by the opportunity to support the maintenance and rehabilitation of forests in Kyoto for improving the multiple roles of the forest such as global warming, biodiversity conservation and underground water recharge [KMFA].* |

| | | |
|---|---|---|
| | *Representatives of private corporations:* reducing global warming; biodiversity conservation; and the provision of fresh water;<br><br>*Local groups*: landslide prevention and soil erosion control. | |
| Production | *Forest volunteers and private corporations:* access to healthy and organic mushrooms (*shiitake*), mulberry and bamboo shoots.<br><br>*Local citizen groups:* access to firewood for home use and for traditional fire festival (*Kurama no Himatsuri*).<br><br>*Forest volunteers:* access to income from the sale of firewood and charcoal. | *We harvest mulberry and process into mulberry silkworm food, mulberry jam processing [KMFA].* |

### 4.4.2 What capabilities have MFs generated to improve functionings?

Here, the analysis is centred on the capability sets that participants drew on as members of the MFs to improve their functionings and well-being. As illustrated in figure 2, these capability sets include livelihoods and activities, knowledge and technology, relationship building and coordination, and freedom and voice.

#### *4.4.2.1 Livelihoods and activities*

The MFs roles in generating capabilities that support livelihoods and activities were distinct across the two study sites. In Ontario, membership in the EOMF provided support to landowners to harvest food and materials for subsistence use and income, and to keep the forest to support recreational and ecological purposes. First, the majority of landowners said that membership in the EOMF provided access to forest management services such as tree

marking and selective harvesting. These services enabled the landowners to keep the forest healthy by identifying and harvesting poor economic trees to make firewood for sale or subsistence use. Second, some of the landowners also mentioned that the EOMF supported them with timber harvesting services and contracting. According to such landowners, this supportive role enabled them to receive a fair market value from the sale of timber and to also keep the ecological integrity of the forest after harvesting. This is because the EOMF engaged only certified harvesters who follow standard certification procedures guaranteeing the ecological, social and economic sustainability of the forest in their operations. Third, survey results confirmed that the majority of the participants were satisfied with the role played by the EOMF to improve local timber commercialization (53.1 %) and processing (50%) (Appendix F, Table F.1).

In the case of Kyoto, the livelihoods and activities capability sets generated by the KMFA focused less on productive and economic values from the forest. The survey findings showed that more than two-thirds of participants either did not consider the KMFA as promoting local timber processing and commercialization or were not satisfied with its role (Appendix F, Table F.2). However, findings from the individual and group interviews revealed that the KMFA rallied volunteer support to individuals and groups from urban areas to improve local conservation activities. Participation in conservation activities also offered opportunities to these groups to physically access forests for recreation, tourism and learning purposes. The KMFA maintained a formal registry of forests owned by individuals, groups and organizations at the local-level that required support to remain healthy. Using this information, the KMFA facilitated agreements between private corporations and local communities to work together to support local forest management. Representatives of private corporations said that through the KMFA, their employees volunteered to undertake conservation activities in rural areas while also learning and having fun in the forest. Also, representatives of local forestry groups said that through the KMFA, private corporations contributed funding and labour to support local forest conservation through thinning, improvement of forestry roads, and construction of signage and restrooms at forest sites. According to all the participants interviewed, conservation activities improved the visual appeal of the forest as the forest became ‘bright and clean’ and safe for recreational use.

#### *4.4.2.2 Knowledge and technology*

In both sites, all the interview participants said that prior to owning or coming into contact with the forest, they had limited knowledge or skills in forestry although this changed after maintaining membership with the MFs. For instance, a participant from the EOMF said, '*we are not wood people by background, but we've learnt a great deal from the EOMF.…two years in a row now we've gone to the forestry symposium …where different speakers talked about woodlots and how to protect them from the ash borer disease'.* In Ontario, all interview participants said that by taking part in workshops and conferences organized or facilitated by the EOMF, they gained knowledge on many aspects of forestry such as economics of woodlot management, management and control of forest hazards (e.g., fire, wind, and ice damage, and erosion) and Indigenous peoples' forest values (e.g., Black Ash' regeneration and medicinal forest plant identification). Also, our review of program documents revealed that the EOMF developed information factsheets on invasive species, species at risk, and management of other forest insects, e.g., Emerald Ash Borer, which is transmitted to landowners. Some of the landowners also mentioned that the EOMF provided specialized forestry advisory services, e.g., preparation of forest management plans, which enabled them to identify and conserve sensitive species or ecozones on their properties. Findings from the survey showed that the majority of participants expressed satisfaction that the EOMF had provided knowledge and information on forest management planning, control of forest diseases, and opportunities for education on Indigenous forest values (Appendix F, Table F.1).

In Kyoto, all individuals and group interview participants mentioned that the KMFA enhanced access to information and knowledge on forests through skills training, participation in forestry workshops and conferences and provision of specialized forestry advisory services. The representatives of private corporations indicated that to reduce the risk of injury to volunteers who undertake conservation activities, the KMFA provided skills training on forest management safety protocols and appropriate handling of forest management tools. In group interviews, forest volunteers emphasized that KMFA facilitated knowledge transfer by organizing peer training workshops between experienced and new volunteers to reduce the risk of injury to new volunteers. Also, participants from all sectors said that they received forest management information from the KMFA through its newsletter, social media page and direct invitation to attend workshops or lectures provided by forestry experts from government and academia at no cost. The majority of participants stated that through these activities they learned about the ecological functions of forests, and types, and effects of forestry diseases. Moreover, participants from the private sector said that they received

forestry advisory services from the KMFA to help them to design and implement forest management activities. In the survey, more than half and almost half of participants expressed satisfaction in the KMFA for providing training and technical support for forest management and for support to control wildlife damage to forests, respectively (Appendix F, Table, F.2).

#### *4.4.2.3 Relationship building and coordination*

In Ontario, all the interviewee landowners indicated they have made friends with and learned from other landowners who are committed to responsible forest management through networking opportunities facilitated by the EOMF. Other landowners also mentioned that they have built connections with foresters from the private sector and government agencies. A landowner stated,

> *I can't describe how useful being part of the EOMF has been to me…. the wide network of experts that I got involved with…I have also made a real good group of close friends with similar interest which has really been important to me… it has really helped to learn what others do.*

The survey results confirmed that the EOMF played an important coordinating and relationship building role (Appendix F, Table F.1). For instance, 71 % of participants expressed satisfaction in the EOMF for supporting collaboration among forest owners and between forest owners and other property owners. Also, 53% of participants expressed satisfaction in the EOMF for fostering collaboration with Indigenous peoples.

In Kyoto, interview and survey participants across all sectors touted the relationship building and coordinating functions of the KMFA. In the survey, over 70% of participants expressed satisfaction in the KMFA for strengthening relationships between local forest groups, private corporations, municipalities, and the prefectural government (Appendix F, Table F.2). Also, in both individual and group interviews, participants averred that cooperation with multiple actors and sectors is necessary for successful conservation activities. Representatives of local forestry groups said that relationship with private corporations improved access to funding and volunteer labour to support local conservation activities. Private corporations also said that partnership with local communities enhanced physical access to forest sites and enhanced their relationship with rural people and the natural environment. Both private corporations and local groups emphasized that local government involvement in conservation activities enhanced access to equipment and tools and seedlings to support conservation efforts. Also,

the majority of group interview participants said that involvement in MF activities enabled them to make new friends, stay active, and overcome boredom.

#### *4.4.2.4 Freedom and Voice*

In Ontario, the majority of interview participants emphasized that the EOMF provided opportunities for certified landowners to have a voice in decision making and to freely pursue activities that enhanced the values of responsible forest management. For instance, through a request by the landowners, the EOMF formed the Eastern Ontario Certified Forest Owners (EOCFO) group that helped to promote the shared values of certification and responsible woodlot management. A landowner stated,

> *I feel good about being part of the group in the sense that I can relate with others who are trying to do the right thing… and I am happier to be able to my forest is FSC certified….that's worth something to my wife and I.*

A review of program documents revealed that the EOFCO operated as an independent group that improved the autonomy and agency of landowners through the establishment of a professional oversight – both formal and informal – on the forestry needs (e.g., education) and concerns (e.g., access to trusted forest specialists including harvesters) of certified landowners. This finding was confirmed by a landowner who said,

> *Initially I was scared of harvesting my woodlot because I heard there were bad loggers out there but through the EOCFO I came to know other landowners who had a record of harvest operations done professionally and that gave me confidence as a new player in the market.*

In the survey, more than two-thirds of participants expressed satisfaction in the EOMF for promoting local-level actor's participation in decisions on forest management (Appendix F, Table F.1). This notwithstanding, more than half of participants also identified the lack of time and longer distance to forestry meetings as affecting effective participation in forest management decisions.

In Kyoto, interviewee participants across all sectors stated that the KMFA's annual symposium on MF activities provided the single biggest opportunity for them to contribute to decisions and share their experiences in conservation activities. This finding was confirmed by the first author who attended the 2016 MF symposium. According to an official of the KMFA, the common issues often highlighted by participants at the symposium shape its

strategic planning and future engagements with actors. Moreover, all the interviewees of private corporations said that the KMFA is very accommodating to suggestions and concerns offered by members and this has brought positive results. For instance, a participant stated,

> *We felt that we needed greater engagement among the private stakeholders because the experiences of the participants were very diverse…..when we communicated this to the KMFA it instituted a periodic meeting with the private sector participants to promote sharing of experiences*.

Two of the private sector participants recalled that one of the most notable outcomes of this meeting was the development of field protocols on reporting and monitoring of conservation activities. According to these participants, the protocol helped to resolve disagreements between private actors and local participants on how to appropriately report on conservation activities. Findings from the survey also showed that more than 80 percent of participants expressed satisfaction in the KMFA regarding the promotion of local-level actor's participation in forest management decisions (Appendix F, Table F.2). However, the majority of participants also identified low participation of women (63.4 %), lack of adequate information (51.2%) and lack of opportunities to participate (46%) as factors affecting effective local participation in forest management decisions.

## 4.5. Discussion

### 4.5.1 Capability analysis of small-scale forest actors' values in two MF communities

The MF initiatives in both sites, although differentiated by dissimilar socio-ecological and cultural characteristics, provided a rich collection of experiences that can be used to understand the influence of collective capabilities on the functionings of small-scale forest actors. Specifically, the findings have highlighted that both the EOMF and KMFA served as important collective institutional arrangements to enhance the capability sets of small-scale forest actors, particularly, to identify with their preferred forest values and the instruments for pursuing them. The main capability sets that actors drew on to improve their functionings were livelihoods and activities, knowledge and technology, relationship building and coordination, and freedom and voice. Table 4.5 and Figure 4.5 show a list of specific capabilities within each of the broad capability sets that emerged from our findings. It is important to emphasize that these capability sets are not mutually exclusive as they relate iteratively and interactively. While some capabilities confirmed those in the literature review,

our research revealed additional elements (Table 4.5). Below, we discuss some of the specific ways these capabilities were generated to improve the functionings of the actors.

First, as our findings showed, in different ways, both MFs provided support, freedoms and opportunities to enable actors to achieve the multiple forest values they hold (section 3.2.1). In Ontario, to enable landowners to pursue productive forest values (e.g., access timber, maple syrup and berries) and also maintain the forest for its aesthetic, recreational and environmental values, the EOMF used a market-based institutional arrangement, i.e., forest certification. Specific practices under the certification such as the access to certified harvesters and tree markers, and the use of selective cutting, enabled the landowners to undertake harvesting efficiently (better economic returns) and effectively (with less ecological damage). Thus, the efficiency and effectiveness under certification enabled the landowners to meet livelihood and subsistence needs, while also meeting the ecological and aesthetic values of their forest, respectively.

In the case of Kyoto, to improve socio-cultural and ecological values mostly held by actors, the KMFA promoted multi-stakeholder collaboration among private corporations, local forest volunteers and various levels of government. Through such cooperative arrangements, collective capabilities in relation to access to labour, funding, and knowledge and skills to support local conservation efforts were significantly enhanced. Representatives of private corporations revealed that membership with the KMFA aided their access to forest sites where they could volunteer their labour to maintain the forest and also relax, learn and connect to the forest. Local conservation groups also reiterated that by partnering with private corporations and local governments through the KMFA, they had better access to funding and volunteer labour, and tools respectively, leading to improved conservation activities. Improvement in conservation activities (e.g., thinning, weeding, and construction and repair of forestry roads) enhanced the visual appeal and physical access to forest, thereby enabling more people including women and children, to visit the forest for recreation and learning. In Japan, a ‘clean and bright’ forest is seen as a culturally appropriate way to maintain deeper socio-cultural connections to nature (Boakye-Danquah et al., 2018).

Table 4.5 Capability sets relevant to improving relationships between forest ES and people

| Capability sets | Source |
|---|---|
| **Livelihoods and activities** | |
| Ability to make use of the forest for food | √ |
| Ability to make use of the forest for fuel | √ |
| Ability to play and enjoy recreational activities in the forest | √ |
| Ability to make use of the forest as sites for education | √ |
| Ability to make use of the forest as sites for spiritual veneration of ancestors | √ |
| Access to forest usage rights | * |
| **Knowledge and technology** | |
| Knowledge about the forest | * |
| Being able to respond to external threats | * |
| Ability to take advantage of external opportunities e.g., funding, training | * |
| Ability to harvest forest products responsible | * |
| Ability to develop forest management and planning systems to conform with local or statutory requirements | √ |
| **Relationship building and coordination** | |
| Ability to connect with or benefit from formal agencies | √ |
| Ability to socialize and learn from others | √ |
| Ability to relate with plants, animals and specific ecozones | * |
| **Freedom and voice** | |
| Ability to participate in decision making | √ |
| Ability to influence decision making | √ |
| Feeling accountable | * |
| Ability to keep and pass on the forest to future generations | √ |

√ confirmed from the literature. * Own findings.

Second, in both MFs, our findings revealed that membership with the MFs enhanced access to knowledge, information and skills required to overcome local-level forest risks and challenges to forest management (section 3.2.2). In Ontario, the incidence of risks such as erosion, species at risk, invasive or non-native species, and other forest diseases and insects (e.g., Emerald Ash Borer) presented a strain on forest ecosystem functioning and the management capacities of landowners. The EOMF served as a platform for landowners to access information and improve their knowledge on forest risks through access to workshops, newsletters and information factsheets. These improved the capabilities of landowners to identify, understand, monitor and manage risks. On the other hand, in Kyoto, the lack of experience in conservation activities by new volunteers and risks of injury were mentioned as

key challenges to local conservation efforts. To overcome these, the KMFA provided access to information and skills training (e.g., appropriate handling of forest management tools) and promoted knowledge transfer between experienced and new volunteers.

Third, and finally, it is important to highlight that in both MFs, capabilities that improved relationships and coordination among landowners and between landowners and other resource actors provided broader landscape-level conservation benefits (section 3.2.3). Because MFs embody large landscapes with different resource actors and users (IMFN, 2017), improvement in relationships among actors can promote social cohesion and coordinated management at the landscape level. Fischer et al. (2018), noted that in small-scale forest communities, landowner coordination is critical to address complex ecological processes that often transcend individual plots. In Ontario, all the landowners valued the friendships they developed with foresters and other landowners with a shared commitment to responsible forest management. These forms of networking promoted learning – both formal and informal – and enhanced the agency of landowners, specifically to access the right information related to market trends for selling logs and engagement with trusted forestry professionals. In the case of the Kyoto, collaboration across different sectors enabled actors to draw on diverse knowledge and resources from forestry professionals, academics and experienced volunteers to improve the success of conservation efforts.

Finally, both MF initiatives provided opportunities for actors to have a voice and to influence decision making in a manner that advanced their values and interests. In the KMFA, opportunities to participate in decision making helped to resolve disagreements between different actors, thereby improving the effectiveness of management actions. In Ontario, the decision to form an independent landowner group improved the autonomy and agency of landowners, particularly, to control relevant information and relate with other professionals. These notwithstanding, the survey participants in both sites highlighted the need for more opportunities for participation. Especially in Kyoto, the low representation of women actors was highlighted. Further probing of the background characteristics of the survey participants (see Appendix A) confirmed that the number of women actors in both MFs was low. This observation confirms a dominant a phenomenon in the literature where women landowners in forest and agricultural sectors tend to be less engaged with conservation agencies due to the failure of the agencies to engage effectively with them (Petrzelkaa, et al., 2018). Yet, in many parts of the post-industrial world, emerging research suggests that the number of women owning landed property in small-scale forestry is increasing (see Nordlund and Westin, 2011; Butler et al., 2018). Thus, MFs as arenas for the emergence of collective capabilities for

diverse actors should develop strategies to identify and engage better with women landowners.

### 4.5.2 Forest values, capability functions and well-being dimensions in small-scale forest communities

Table 4.6 shows a summary of how forest ecosystem services can be converted to various well-being dimensions via capability sets. The well-being dimensions highlight the existence of both material and immaterial components depending on the forest values held by an actor. Table 4.6 shows the relationship between specific capability set and potential well-being improvements in the EOMF and KMFA respectively. Table 4.6 highlights that MFs as collective governance organizations create diverse opportunities that improve valued outcomes for diverse participants. These outcomes include effective participation in the governance process, improvement in the capacity to manage ecosystems, and opportunities to derive diverse use values of local ecosystems.

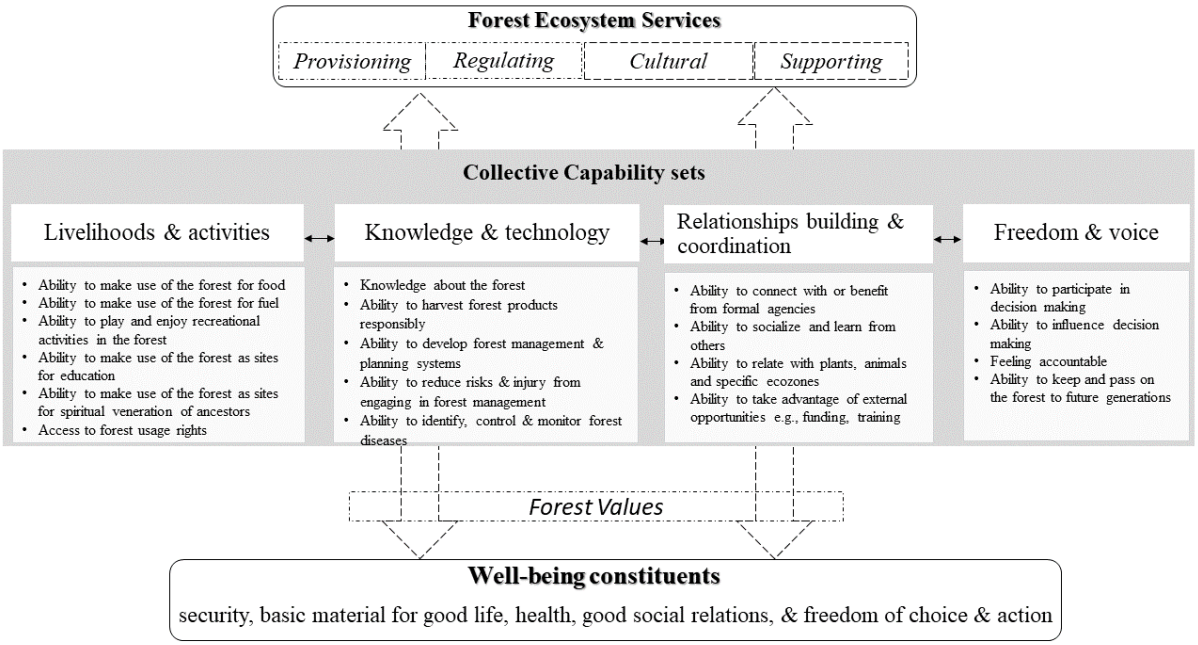



Figure 4.5 Relationships between forest values, capabilities and human well-being

In the EOMF, relatively more participants (section 3.1) emphasized productive and direct material values (e.g., income and subsistence use from timber, fuelwood, maple syrup and berries) from the forest compared with the KMFA (Table 4.6) likely because more landowners in the EOMF have a direct economic stake. As a result, participants in the EOMF drew on diverse capabilities with the potential to improve well-being related to basic material

for good life and health. In the KMFA, only one form of capability (e.g., ability to make use of the forest for fuel) emerged as important for improving well-being related to basic material for good life.

In both sites, indirect values related to socio-cultural and environmental components such as nature recreation (e.g., hiking, wildlife watching and sports and entertainment), environmental learning, and cultural identity and continuity (Table 4.6) appeared strongly to mediate one's relationship with the forest. Capabilities that improved socio-cultural values can enhance well-being related to social relations, security of resources, and freedom and choice (Table 4.6). For instance, in both MFs, the emphasis on environmental education, especially for children, through contact and experience with forests can improve relationships with forest. Moreover, capabilities that improved recreational outdoor forest experiences expressed by participants in both MFs have the potential to enhance individual well-being related to good health (physical, emotional, and spiritual), social relations and security of resources.

Table 4.6 Relationship between capability sets and potential well-being constituents among actors in the KMFA and EOMF.

| Capability sets | Basic materials for life | | Good health | | Social relations | | Security of resources | | Freedom & choice | |
|---|---|---|---|---|---|---|---|---|---|---|
| | EOMF | KMFA | EOMF | KMFA | EOMF | KMFA | EOMF | KMFA | EOMF | KMFA |
| **Livelihoods and activities** | | | | | | | | | | |
| Ability to make use of the forest for food | √ | | √ | | | | | | | |
| Ability to make use of the forest for fuel | √ | * | √ | | | | | | | |
| Ability to play and enjoy recreational activities in the forest | | | √ | * | √ | * | √ | * | √ | * |
| Ability to make use of the forest as sites for education | | | | | √ | * | √ | * | √ | * |
| Ability to make use of the forest as sites for spiritual veneration of ancestors | | | | | | * | | * | | * |
| Access to forest usage rights | | | | * | | * | | * | | * |
| **Knowledge and technology** | | | | | | | | | | |
| Knowledge about the forest | √ | | √ | | | * | √ | * | | |
| Ability to harvest forest products responsible | √ | | | | | | √ | | √ | |
| Ability to develop forest management and planning systems | √ | | | * | | * | √ | * | | |
| Ability to reduce risks and injury from engaging in forest management | | | | * | | * | | * | | * |
| Ability to identify, control and monitor forest diseases | √ | | | | | | √ | * | | * |
| **Relationship building and coordination** | | | | | | | | | | |
| Ability to connect with or benefit from formal agencies | √ | | | * | √ | * | √ | * | | * |
| Ability to socialize and learn from others | | | | * | √ | * | √ | * | √ | * |
| Ability to relate with plants, animals and specific ecozones | | | √ | | √ | | √ | | | |
| Ability to take advantage of external opportunities e.g., funding, training | | | | * | | * | √ | * | √ | |
| **Freedom and voice** | | | | | | | | | | |
| Ability to participate in decision making | | | | | √ | * | √ | * | √ | * |
| Ability to influence decision making | | | | | √ | * | √ | * | √ | * |
| Feeling accountable | | | | | √ | * | √ | * | √ | * |
| Ability to keep and pass on the forest to future generations | √ | | | √ | √ | * | √ | * | √ | * |

Among the actors in both MFs, the diverse ecological values of the forest such as a source of water, erosion and landslide control, and as habitat for plant and animal species, also appeared as strong mediators of actor's relationship with the forest. The participants emphasized the

need to collectively maintain and pass these ecological functions of the forest to future generations. In both MFs participants expressed a sense of responsibility towards protecting the forest for both the past and present generations. Thus, in both MFs, the capability sets (e.g. knowledge of the forest, ability to relate with other species and respond to external threats) that guaranteed the ecological functions of the forest for current and future generations appeared important to their well-being, particularly related to the security of resources.

Finally, the majority of actors in both MFs maintained the forests for mixed values (section 3.1), suggesting that the existence and integration of productive, socio-cultural and ecological values, is essential to well-being. In the KMFA, socio-cultural values related to recreation and learning provided motivation to conserve the forest for its intrinsic worth. Thus, the capability sets that improved local conservation activities appeared to also promote the aesthetic and recreational value of the forest. Similarly, in the EOMF, capabilities that enhanced production values, such as ability to harvest forest responsible, also helped to secure sensitive ecological species and improved the aesthetic appeal of the forest. Thus, in both MFs, capabilities that secured forest ecological values also helped to secure the forests for socio-cultural and productive uses and vice versa, for current and future generations. These understandings of the interplay between and among different values provide a better and holistic understanding of local well-being dimensions and their relationships. Thus, our approach broadens understanding of the mutually beneficial outcomes of combining social, ecological and economic objectives to improve understanding and management of ecosystems for specific groups.

### 4.6 Conclusion

Our study used a CA lens to understand how voluntary landscape-level organizations, specifically MFs, with a focus on small-scale foresters generate opportunities and freedoms to improve people's relationships with forests ecosystems. The application of CA in the context of the MFs resonates with calls for more systematic inclusion of the natural environment in CA studies and the need to understand the influence of social institutions on individual capabilities and well-being (Polischuk and Rauschmayer, 2012; Griewald and Rauschayer, 2014).

Within the broader ES governance literature, questions about how to design governance arrangements to effectively embrace and manage diverse forest values and goals remain an important governance and management concern. Our findings demonstrate that a CA analysis

focusing on collective capabilities is helpful in envisioning an effective governance arrangement that can respond to the peculiar ES governance challenges confronting owners and managers in small-scale forest landscapes. Specifically, a CA analysis helped to capture the diversity of ways forest ES are valued and their interplay by actors in MF landscapes. In addition, a CA analysis demonstrated how voluntary landscape-level governance arrangements such as MFs can enable multiple actors to lead the kind of lives they value and the instruments for pursuing them. These findings support the growing recognition that re-coupling human-ecosystem relationships can create mutually reinforcing benefits for both people and ecosystems.

To reiterate our main findings again, both the EOMF and KMFA improved the capability sets of actors by promoting forest livelihood and activities, knowledge and technology, relationship building and coordination and freedom and voice. Collectively, these capabilities improved the functionings of the actors, particularly to promote and pursue shared values (e.g., being able to manage and harvest forest responsible or conserve forests for future generations) relative to access, utilization and management of forest ecosystems. The improvement in functionings provided several opportunities to enhance various dimensions of well-being – both instrumental and intrinsic – for specific actors. Future research needs to examine more deeply the connections between the capabilities and specific forms of well-being identified. This can help to understand appropriately the well-being dimensions of small-scale foresters. Moreover, such studies need to specifically target women landowners so as to better understand what they value, and the capabilities required to improve their functioning and well-being.

# CHAPTER 5 – CONCLUSIONS: MULTI-LEVEL ENVIRONMENTAL GOVERNANCE, BRIDGING ORGANIZATIONS, AND SUSTAINABLE MANAGEMENT OF SMALL-SCALE FORESTS

## 5.1 Thesis Summary

This research sought to assess the effectiveness of BOs in convening private-social partnership arrangements to support governance for the sustainable management of small-scale forests. Using a multiple case study approach, the research drew on the work of two MF organizations – the Eastern Ontario Model Forest in Canada and the Kyoto Model Forest Association in Kyoto, Japan – to examine how BOs convene private-social partnership arrangements to improve the sustainably management of forests. Although the selected MF cases are located in different institutional, socio-ecological and cultural contexts, both are focused on small-scale foresters. The focus on MFs – where collaborative and innovative landscape-level approach to forest management are promoted – provided a unique context to examine how private-social partnership governance arrangements are implemented and facilitated on the ground and their potential impacts for both ecosystems and people.

In eastern Ontario, Canada, the thesis examined the role of the EOMF in facilitating a market-based governance instrument involving the Forest Stewardship Council's forest management certification program to improve the sustainable management of Non-Industrial Private Forests. Similarly, in Kyoto, the thesis examined the role of the KMFA in facilitating a multi-level and collaborative governance arrangement to improve the management and conservation of underutilized rural forest landscapes. In the context of these two cases, the broader objectives of the thesis were as follows:

1) Assess the effectiveness of MFs as BOs in convening private-social partnership arrangements to improve local socio-ecological sustainability;
2) Assess the effectiveness of MFs as BOs to improve the effective participation of local actors in private-social partnership arrangements;
3) Examine how MFs can improve local dimensions of well-being through MLG arrangements; and
4) Consider the implications of private-social partnerships in multi-level forest governance arrangements for the sustainable management of small-scale forests.

Chapters 2 and 3 assessed the effectiveness of MFs as BOs in convening private-social partnership arrangements to promote the sustainable forest management of small-scale forests (Objectives 1 and 2). Chapter 4 on the other hand examined how MFs acting as collective social institutions improve the well-being of small-scale forest actors (Objective 3). The findings of all three chapters provided useful lessons on the application of private-social partnership arrangements to enhance the sustainable management of small-scale forests (Objective 4). Specifically, the findings suggest that MFs as BOs improve the effectiveness of private-social partnership arrangements by aligning governance arrangements to fit the underlying social context, optimizing private-social partnerships to address local needs, interests and values and improving valued outcomes for small-scale actors through creating opportunities and freedoms that improve different dimensions of well-being.

Chapter 2 examined how the KMFA facilitated the transformation of underutilized forest landscapes in Kyoto, Japan using a private-social partnership arrangement. Drawing on the concept of social fit, this chapter developed a novel analytical approach to assess the role of BOs in supporting local led efforts to improve human-ecosystem relations in the underutilized rural forest landscapes of Japan. The chapter highlighted that the KMFA used diverse mechanisms to improve social fit, and thereby transform peoples' relationship with forests. Some of the key bridging functions highlighted by this chapter included: prioritization of public education and access to information; investments in places and systems to reconnect people to ecosystems; reduction in transaction costs of participation; building trust and reducing value mismatches; provision of incentives and funding; and fostering leadership to draw support from diverse organizations. The chapter revealed that the cumulative impacts of these bridging functions provided new avenues for forging closer links between people and forests, built new local institutions and capacity for ecosystem management, and streamlined existing institutional arrangements for improving socio-ecological sustainability. Despite the positive impacts from these arrangements, the chapter highlighted that because of the diversity of stakeholders served by the KMFA, the extent and type of social fit achieved were different for different stakeholder groups. Thus, the chapter highlighted the need for continuous stakeholder interactions, particularly with less powerful actors, so as to respond to their specific needs and interests as part of the broader governance processes. More broadly, the chapter made three key contributions to the literature on ecosystem governance transformations and the concept of social fit. First, the focus on a BO such as the KMFA as a case study provided a new empirical understanding on how and under what conditions a BO can address context-specific social conditions to enable the transformation of underutilized

ecosystems work in practice. Second, the chapter highlighted that although BOs are critical to ecosystem transformations, in practice, transformation arrangements are complex and tend to be influenced by diverse contextual factors. Examples include the existing institutional arrangement for resource management, knowledge and status of the ecological system, the services it provides and for whom, and the dynamics of the social system. Third and finally, the chapter argued that since social fit is very dynamic and stakeholder dependent, future research needs to track stakeholder satisfaction over time. In these contexts, the chapter argued that paying more attention to these complexities can improve the conceptual rigour and the practice of ecosystem transformation.

Chapter 3 assessed the role and effectiveness of the EOMF in promoting the participation of NIPFOs in a market-based ecosystem governance arrangement in eastern Ontario, Canada. This chapter proposed a new approach to assess the role and effectiveness of intermediaries that promote the participation of NIPFOs in a market-based ecosystem governance arrangement. The chapter operationalized the concept of effectiveness to mean the capacity of an intermediary organization to address the challenges that limits the participation of NIPFOs in certification (e.g., reduce transaction costs of participation), improve the benefits of certification for NIPFOs (e.g., enhance market access and price premiums), and contribute to broader local conservation efforts. By drawing on intermediary roles in the broader literature and findings from study, this chapter argued that intermediary roles in a market-based ecosystem governance arrangement involving small-scale actors follow three program implementation phases. These are program design and implementation (early-phase), routine administrative and organizational work (take-off phase), and organizational and financial sustainability (long-term phase). This chapter further highlighted specific intermediary roles in each of the phases and their implications for achieving effectiveness. This chapter argued that the existence of the three program implementation phases have significant influences on intermediary roles and by extension its effectiveness For instance, in the early phase, intermediary roles that focused on building broad institutional support and local legitimacy were significant to enhance participation effectiveness e.g., reduce private transaction costs and enhance the participation of landowners. Also, in the second phase, this chapter highlighted that the focus on routine administrative (e.g., monitoring and reporting), and organizational (e.g., landowner recruitment and capacity building) duties were critical for meeting program requirements and to broaden landowner participation. In the third phase, this chapter revealed that intermediary roles that focused on securing the organizational and financial sustainability of the program through cost-saving measures and new funding

sources, had both positive and negative effect on landowner participation. In summary, this chapter highlighted that across the different phases of the certification program, the key attributes of the EOMF that enabled it to perform effectively were its capacity to build social capital and run the certification program at a relatively low cost, optimize program benefits to align with local needs and interests, and innovate and adapt to program changes and stakeholder demands. The analytical framework developed in this chapter can be adapted beyond forestry to assess the potential of diverse intermediaries to achieve effectiveness for different market-based ecosystem governance arrangements, particularly if landowner participation is a key component of program effectiveness.

Chapter 4 examined how MFs utilize voluntary and collective governance arrangements to improve the well-being of small-scale forest actors. The chapter argued that although many small-scale forest communities, particularly in the post-industrial north, have witnessed significant reduction in social capacity to manage local ecosystems, few governance interventions have successfully been implemented to address this challenge. Thus, this chapter demonstrated how landscape governance arrangements such as Model Forests (MF) create opportunities and generate capabilities to improve ecosystem management and enhance local dimensions of well-being. The chapter used the concept of capabilities, specifically collective capabilities, to understand how MFs serve as collective action space to enable participating actors to live the kind of lives they value and the instruments for pursuing them. The findings of this chapter showed that membership of both MFs enabled participants to improve diverse forms of capabilities – both individual and collective, that improved different constituents of well-being linked to forest ecosystems. The capabilities identified were broadly related to livelihoods and activities, knowledge and technology, relationship building and coordination, and freedom and voice in decision. The findings showed that improvement in capabilities enhanced the use, access and management of the ecosystem by different actors. Based on the findings, this chapter demonstrated that voluntary landscape-level governance arrangements such as MFs hold significant potential to address the lack of social capacity characterizing small-scale forest communities in the post-industrial north. These notwithstanding, the findings also revealed that there is low representation of women actors involved in both MFs. Hence, this chapter suggested that voluntary landscape-level governance arrangements such as MFs need to develop strategies to identify and engage better with diverse and broader actors, particularly, women landowners.

In summary, examining the roles of two BOs with a similar interest in small-scale foresters but located in different institutional, cultural and socio-ecological settings, the thesis has

broadened understanding – conceptual, empirical and practical – on the roles of BOs in convening private-social partnership arrangements to improve governance for the sustainable management of small-scale forests. Specifically, by assessing the role and effectiveness of BOs in private-social partnership arrangements, the thesis has broadened understanding on how BOs: (1) convene private-social partnerships to align to social conditions at the local-scale; (2) enhance the effective participation of local actors in private-social partnership arrangements; (3) create opportunities and freedoms to improve small-scale forest actors ability to access, utilize and manage forest ecosystems and improve their well-being; and (5) envision and facilitate ecosystem management outcomes that supports human well-being and healthy ecosystem functioning synergistically. These findings have significant implications for improving the effectiveness of MLG arrangements some of which are discussed in section 5.3.

### 5.2 Challenges

There are five main challenges that I encountered undertaking this thesis. The first challenge was the difficulty in the design of field data collection and analysis for both cases in Japan and Canada. As stated before, although both MFs focus on small-scale foresters, the sheer contextual differences e.g., socio-ecological system differences, made the research design difficult. For instance, as part of the research, I collected survey data on the factors that motivate actors to collaborate using common variables across both cases. However, this was challenging as the majority of the survey participants found some of the variables on cross comparison less applicable to their context, thus affecting the response rate on such sections of the survey. In terms of the analysis of the data, I repeated some of the results across more than one manuscript. For instance, the survey results on levels of satisfaction had to be used in both manuscript 1 and 3.

The second challenge that I encountered was the language barrier relative to the field work in Japan. The inability to read Japanese affected the type and number of program documents from the KMFA that I could review. Although I had the support of volunteers to review program documents from the KMFA, I believe I could have derived more useful data if I understood the Japanese language. The language barrier also affected interactions during interviews. Because of the additional time taken by the interpreter during interviews, most of interviews were prolonged although I could not ask all my follow-up questions. In addition, I could not understand or capture the feelings, behaviours and attitudes of my respondents, some of which could be important pointers to pick in qualitative research.

Third, in the Kyoto case, I proposed before the field work to examine a PES program involving one private company and the KMFA. However, when I got to the field, I expanded the focus to include three additional private companies working with the KMFA. This is because once in the field, I derived limited information from the earlier proposed case. Moreover, I could not secure permission to interview additional stakeholders who were part of the earlier proposed case. While the inclusion of additional private companies improved the data collected, the inability to plan for this affected the inclusion of more private companies and their accompanying stakeholders who had to be interviewed. This is because the participants required longer prior notices before being interviewed and I could not do this within the limited time I was in the field.

Fourth, in eastern Ontario, because the landowners were scattered widely in different towns across the landscape, it was difficult to reach out to them physically. As a result, most of the landowner interviews were conducted on the phone. Also, the field work coincided with significant changes in the program staff of the EOMF. For instance, the coordinator of the certification program who had been in charge for over a decade had accepted a new position in a different sector at the time of my field work. In addition, the general manager of the EOMF had retired and a new general manager had just assumed office after I arrived for my field work. While I had significant support from the program staff, particularly the outgoing program coordinator, I believe I could have had a different experience and support from the staff of the EOMF were it not for these changes.

Fifth and finally, in both cases, since I depended on the facilitating organizations to reach out to most of my participants, there was less flexibility in which landowners to choose to interview. The inability to have flexibility in selecting the landowners could have affected the kinds of feedback that I received. I felt that the landowners or participants who were more engaged in both organizations were more willing to be interviewed than those less engaged.

### 5.3 Contributions and Significance

The three manuscripts presented in this thesis contribute to conceptual, empirical and practical work on bridging/intermediary functions in multi-level environmental governance arrangements.

In terms of conceptual contributions, this thesis provides new approaches to assess bridging/intermediary roles and effectiveness in private-social partnership arrangements for

sustainable forest management, particularly from a developed country context. From the broader market-based ecosystem management literature, most studies that examine the role of intermediaries often do so on the basis of four main roles: scoping and scheme design; scheme administration; representation and mediation; knowledge generation and exchange (see Cook et al., 2017; Huber-Stearns et al., 2013). However, based on the findings of thesis, the roles of intermediary were re-categorized into three broad types based on differences in program implementation phases. These are program design and implementation (early-phase); routine administrative and organizational work (take-off phase); and organizational and financial sustainability (long-term phase). This novel approach to understanding intermediary roles recognize that different program phases influence the kind of roles performed by intermediaries and that these phases have implications for understandings of effectiveness. The re-categorization of intermediary roles has implications for measuring program effectiveness, which I discuss below.

The thesis proposed a new approach to assess the effectiveness of an intermediary organization in the broader context of market-based ecosystem governance arrangements. The framework linked intermediary roles to specific indicators of effectiveness– cost, extent of participation, benefits for local participants, and total ecosystems conserved (see Figure 3.1, Chapter 3). Previous studies had assessed effectiveness differently from roles of governance organizations that facilitate such arrangements (see Schomers et al., 2015; Mettepenningen et al., 2013). By linking intermediary roles to specific indicators of effectiveness in a new analytical framework (see Figure 3.1 Chapter 3), this thesis proposes a new approach to assess the effectiveness of intermediary organizations within the broader market-based payment for environmental services literature. Specifically, the chapter defined intermediary effectiveness as the capacity of an intermediary organization to address the challenges that limits the participation of NIPFOs in certification, improve the benefits of certification for NIPFOs and contribute to local conservation efforts. Thus, the framework marks a significant departure in certification research from a focus on objectives of voluntary standard setting, often as reference point, to how certification can be leveraged to benefit local actors at the bottom of the value chain. Thus, the EOMF's roles provide an example of how facilitating organizations can optimize market-based instruments to address local specific socio-ecological challenges while contributing to broader conservation gaols. The framework can be adapted beyond forestry to assess the potential of diverse intermediaries to achieve effectiveness for different private-social ecosystem management programs. This is because diverse intermediaries

targeting small-scale resource users are likely to go through similar program implementation phases. Thus, the framework can be applied in different institutional contexts.

Moreover, the thesis contributes to further development of the transformation concept in the governance and management of decoupled social and ecological systems. The transformation concept proposes new ways to protect and conserve ecosystems by supporting local-led efforts to create novel and direct long-term links between social and ecological systems (see Fischer et al., 2012; Takeuchi et al., 2016; Mohammed et al., 2016). Although the theory behind the concept of transformation is well understood, how to assess and diagnose it is unclear. This thesis drew on the concept of social fit to diagnose how transformation works in practice (see Table 2.1, Chapter 2). Using a new framework to understand the practice of transformation, the findings of the thesis highlighted that the transformation of decoupled social and ecological systems tend to be more complex rather than the simplistic postulations often advanced in the literature (Figure 2.4). Particularly, the thesis argued that any analysis of transformation of decoupled social and ecological systems needs to consider the influence of the institutional context for resource management, the status of the ecological system, the benefit it offers and for whom, and the dynamics of the social system. The framework can be applied in other contexts to examine the efficacy of transformation strategies in recoupling social and ecological systems.

Empirically, the thesis provided two main contributions, i.e., broad contribution to the practice of MLG arrangements and other specific contributions to several other concepts used in the thesis. First, relating the role of both BOs to the challenge of convening private-social partnership arrangements in practice, the thesis highlighted the need to pay more attention to the role of MFs in broader discussions on MLG arrangements. A major challenge with MLG is how to enable interactions and facilitate coordination and cooperation between and among actors (cf. Nunan, 2018). The findings of the thesis showed that both MFs enhanced coordination and cooperation between and among actors by facilitating formal working agreements between and among diverse actors from government, private sector, and local community. For instance, in Ontario, the EOMF created hybrid governance structures with representation from governments, local forestry associations, private forest companies and local conservation agencies to provided strategic direction to the effective implementation and management of the certification program.

In addition to facilitating cooperation and coordination among actors, both MFs ensured that there is clear definition of roles and responsibility, practices which helped to address the

problem of poor accountability and responsibility for decision making typical with most MLG arrangements (cf. Nunan, 2018; Termeer et al., 2010). In Kyoto, formal agreements facilitated by the KMFA between local actors, government and private sector, came with clear definition of roles and responsibilities of the actors, thus enhancing effective decision making. For instance, through the KMFA's formal cooperative agreements, private corporations were responsible for providing volunteer labour and funding; local governments provided tools, equipment's and seedlings; while local communities provided monitoring and access to forest sites. Thus, through these arrangements, the KMFA helped to define clearly the roles and responsibilities of various actors in the governance process and helped to enhance the legitimacy of the governance process.

Second, both MFs also helped to reduce the transaction cost of participating as well as of coordinating multiple actors, a challenge which often limits the effectiveness of MLG arrangements (cf. Termeer et al., 2010). In eastern Ontario, to improve the participation of landowners in the certification program, the EOMF provided information and knowledge on certification (e.g., cost, benefits, and requirements for participation and challenges) to landowners at no cost, thus reducing informational barriers to accessing certification. Also, in Kyoto, the KMFA invested in systems and places (e.g., the location, ownership and challenges of specific forest landscapes) for connecting people to forest landscapes. This information was made available and accessible to private corporations at no cost, and thus aided the decision-making choices of the corporations of where and how to invest in local forest management. This also helped to reduce the cost, time and commitment involved in forming new partnerships with local actors.

Third, MLG arrangements involve multiple actors who may not only have different values and goals but also different capabilities to contribute to the success of the governance process (Nunan, 2018), factors which can affect the effective implementation of MLG arrangements. The findings of this thesis have shown that MFs create diverse opportunities to improve the capacity of various actors to contribute to the effectiveness of the governance process. For instance, in Kyoto, the KMFA offered opportunities for volunteers of private corporations to improve their knowledge and skills in local forest management which reduced the potential for harm and injury in undertaking forestry work. Similarly, in Ontario, the EOMF provided opportunities for forest managers to improve their ability to identify and document high conservation forest values which were required by auditors in the certification program.

Fourth and finally, the thesis contributes to how MLG arrangements can be enhanced by improving understanding of how to identify which governance actors are relevant and how to 'fit' the governance arrangement to align with place-specific and dynamic social conditions (Nunan, 2018; Brondizio et al., 2009). The findings showed that both MF organizations helped to enhance fit, particularly social fit, thereby improving the effectiveness of MLG governance arrangements. For instance, in Ontario, the EOMFs long history of involvement in working with multiple actors in the region helped it to identify and integrate the appropriate actors in the governance of the certification program. In addition, the EOMF involved all relevant actors in the selection of the appropriate certification program that was consistent with the values of local and regional actors. The involvement of local actors in the identification and selection of the appropriate certification program, that is the FSC certification program, not only enhanced the legitimacy of the governance process, but also enhanced local ownership of the certification program. In the Kyoto case, aligning private-social partnership arrangements with the dynamics of the social system involved: (a) identifying and integrating existing resource users and their interests, values and priorities in the governance system; (b) fostering meaningful stakeholder participation through the provision of incentives; and (c) connecting multiple institutions and actors to build broad support and motivation for ecosystem management.

Beyond advancing the empirical contributions of MFs as BOs to the effectiveness of MLG arrangements, this thesis also provided several other specific empirical contributions. First, the thesis provided context specific evidence to support the growing recognition that re-coupling human-ecosystem relationships can create mutually reinforcing benefits for both people and ecosystems, especially in systems where direct livelihood dependence on ecosystems are increasingly becoming disconnected (cf. Fischer et al., 2012; Takeuchi et al., 2016; Loring et al., 2016). For instance, in Kyoto, the findings showed that reconnecting people to ecosystems improved conservation while also enhancing diverse physical, emotional, cultural and educational benefits for people. Improved benefits from the ecosystem provided further incentive and motivation to protect the ecosystem. Additionally, in both Kyoto and Ontario, improving local management capacity through knowledge and skills provision to enable people to act sustainably enhanced ecosystem functioning while also improving the benefits people derive from ecosystems. Thus, this study supports the call for improvement in knowledge to guide policy development and management interventions that improve recoupling of people with local ecosystems for improved socio-ecological sustainability (cf. Loring et al., 2016).

Second, the thesis provided a context specific understanding of how the transformation of underutilized landscapes can be operationalized in practice through the support of a bridging organization. While the theoretical and conceptual framings of transformation strategies are still developing (Fischer et al., 2012; Takeuchi et al., 2016; Mohammed et al., 2016), empirically-based understanding remains limited. Specifically, little is known about how, and under what conditions, governance organizations such as bridging organizations, can address context-specific conditions in underutilized landscapes to enable recoupling of human-ecosystem relationships. Thus, by examining the role of the KMFA in the transformation of the underutilized forest landscapes of Kyoto, this thesis contributes to enhancing understanding of how transformation is designed and practiced (see Chapter 2). The findings from this thesis showed that reducing the transaction cost for diverse external stakeholders, including private corporations and urban citizens, to access forest ecosystems and also participate in local ecosystem management can provide new avenues to build novel connections that can revitalize underutilized rural forest landscapes. In this context, the thesis highlighted context-specific bridging functions that enabled the recoupling of human-ecosystem relationships.

Third, the thesis contributes to fill a major empirical the gap relative to the effectiveness of small-holder certification systems particularly from the global north. While small-holder certification systems have been developed to address the lack of access to certification for small-holder foresters, small-holder forest certification systems remain a relatively new policy tool, and hence, their impacts and effectiveness are not well understood (Hoang et al., 2015; Bakker, 2014; Auer, 2012), particularly in developed country contexts. Thus, focusing on a Canadian case on how small-holder certification systems work has added an important empirical data on small-holder forest certification systems in a developed country context. Canada has the largest area of third-party certified forest globally (NRC, 2015), but certification in Canada is driven by large-scale foresters operating on publicly owned land. Thus, the focus on small-scale private landowners in Canada provide a new perspective to better understand the potential of certification to improve the sustainably management of private small-scale forests.

Fourth and finally, the thesis has helped to fill in gaps in MF research. The growth in the adoption and the application of the MF concept to achieve SFM globally has also attracted interests from many researchers. However, a critical review of the MF research showed that no study has been undertaken that explicitly assesses the role of MFs in the governance of small-scale forests. Thus, by focusing on two MFs – the EOMF and KMFA – with a focus on

small-scale foresters and across different continents, this thesis has helped to fill an important gap in the MF research. Also, the MF concept has been criticised for failing to demonstrate the achievement of economic, ecological and socio-cultural outcomes on the ground (see Elbakidze et al., 2010). This thesis has contributed to address this gap by demonstrating how MFs generate capabilities to improve the well-being e.g., income, food, cultural continuity etc., of small-scale forest actors (see Chapter 4). Thus, the findings derived from the two cases across different continents in the post-industrial world contribute to better understand how MFs are meeting local-level sustainability goals. Such a comparison contributes to inform both the concept and practice of MF. With the exception of few studies (e.g., Elbakidze et al., 2010), cross-country comparisons of MF initiatives are few.

Regarding methodological contributions, this thesis demonstrates the benefit from using multiple but dissimilar cases in quality research. Since the selected cases were dissimilar in terms of context, the objective was not to compare cases but to provide illustrative examples of how private-social partnership arrangements evolve to respond to specific local ecosystem management challenges at different sites. The illustrative examples yielded both similar and dissimilar results, which can form a basis to refine existing concepts or theories or to develop a new one (cf. Yin, 2014). For instance, in the case of the EOMF, the evolution of the certification program was in response to an economic motivation although the economic motivation dissipated, and social and ecological motivations rather sustained it. In the case of the KMFA, the evolution of the governance program was in response to a social motivation to improve human relationships with the forest. However, the dominant narrative in the literature suggests that private-social partnership arrangements, such as PES and certification, primarily seeks to leverage economic interests by creating incentives for individuals, corporations, organizations and communities to protect ecosystems and ecosystem services (Kenny et al., 2011). Thus, both cases challenge this preposition since leveraging social and environmental interests were the key drivers not only to begin but also to sustain such governance arrangements for both local and external stakeholders to protect ecosystem services. In this context, the findings from the dissimilar cases provide a basis to refine prepositions surrounding private-social partnership arrangements for ecosystem management.

In terms of practical and policy contributions, MF managers and promoters and other conservation agencies, particularly those working with small-scale foresters and in rural forest communities, may benefit widely from the findings of this thesis. Generally, working models of landscape-level sustainable resource management, especially those involving private landowners, remain very challenging both technically and organizationally (Fischer et al.,

2018). However, the findings from this thesis have demonstrated that MFs as MLG arrangements hold potential to promote sustainable management of small-scale forests. Below, I list some of the potential lessons, both positive and negative, that MF managers, promoters and other conservation agencies can learn from this thesis. Some of these are specific to the cases studied while others can be applied to other MFs or bridging organizations in general.

- Managers of both MFs can benefit from the diverse range of forest values identified in the MF landscapes studied. Specifically, the findings from both cases demonstrate that forest values in both MFs are diverse, complimentary and dynamic. The majority of actors in both MF cases held socio-cultural and ecological values. Knowledge of forest values is very important to improving peoples' relationships with forests (Nordlund and Westin, 2011). Thus, for managers of both MFs, the identified values can serve as a basis to establish new programs that align with broader stakeholder expectations, improve management effectiveness and enhance policy fit.
- In both landscapes, governments remain significant actors in the governance of small-scale forests and in the roles of MFs. The findings showed that governments served diverse roles as initiators, promotors, and supporters of private-social partnership arrangements. Hence, governments can benefit immensely from the findings of this study. In the EOMF, the findings showed that government's technical and funding support to the certification program were crucial to its evolution. Hence, the withdrawal of government support affected the long-term sustainability of the certification program, particularly to attract new or retain old landowners. This suggest that support from government is very critical not only to the work of MFs but also to the success of private-social partnership arrangements. In the long-term, government can contribute to sustain the certification program by developing specific policies to promote the market benefit of certification. Specifically, the use of government procurement policies to procure wood from small-holder certified forests can be explored.
- Similarly, in Kyoto, the role of the government was critical to the evolution and success of the KMFA. As the initiator of the KMFA, the Kyoto City and prefectural government continue to maintain a close relationship to it and as well provide funding for its activities. However, since the KMFA is witnessing gradual withdrawal of governmental funding, the KMFA can learn from the EOMF how the withdrawal of government funding affected its work and the strategies it adapted to overcome it.

- In both MFs, the knowledge and skills of specific individuals in offering leadership and providing technical and managerial expertise to moderate and leverage the interests, resources and knowledge base of all stakeholders were significant. This suggests that, in private-social partnership arrangements, the role of specific individuals in providing superior leadership to enable interactions and linkages, both vertical and horizontal to occur, are significant.
- Also, managers of both MFs can draw important lessons from concerns raised by some of its stakeholders. In the EOMF, the NIPFOs expressed worry and uncertainty about the future of certification on private land since the EOMF's current focus has shifted to relatively large-scale forests, especially community forests. While this new focus by the EOMF is desirable to sustain the financial sustainability of the certification program in the long-term, managers of the EOMF need to find a balance to keep the participation of private landowners even as more large-scale producers are enrolled.
- Similarly, in the KMFA, managers need to address the concerns of local volunteers and citizens groups who felt the KMFA focuses more on the concerns of the private corporations over that of the others. In addition, some local stakeholders expressed worry over the uncertainty regarding the continuous involvement of private corporations in local forest management. Perceived uncertainty about future collaborations can affect commitment of local stakeholders if not addressed timely.
- Furthermore, in both MFs there is the need for managers to consciously improve the participation of women actors or landowners. While it is beyond the scope of this thesis to explain why women participation in both MF programs is low, if the findings from emerging research in this field are anything to go by, attracting women landowners may require different approaches than what currently pertains (see Butler et al., 2018; Petrzelkaa, et al., 2017). Since women landowners tend to prioritize different landscape values than what many conservation agencies focus on, appealing to women landowners may require different approaches. As a first step, learning more about what women landowners' value and how they want to be engaged would be desirable.

In summary, the findings of this thesis has provided context specific examples of bridging functions and practices that facilitate interactions and linkages characterizing MLG. By learning from the cases of two MFs with a similar focus on small-scale foresters but located in dissimilar contexts, the thesis has contributed to a better understanding on how different types

of private-social partnership arrangements evolve, generate impact, and can be sustained. Primarily, the existence of a shared local-socio-ecological problem that also has regional or national implications drove the evolution of each private-social partnership arrangement. Yet, as the findings illustrated, this is not enough to initiate private-social partnership arrangements as the role of BOs in initiating, facilitating, implementing and sustaining such arrangements are critical. A critical question arises as to whether different type of BO other than the MFs could have initiated the governance arrangements and generated the impact they did in the specific cases studied. While this is debatable, I argue that the status of the BOs as MFs had a significant impact on the success of the initiatives discussed in this thesis. Both MFs emerged largely as a form of top-down arrangements from government. As a result, the support from government in terms of funding, human capital, and legitimacy have been critical to the successful implementation of the private-social partnerships in both MFs. More importantly, in both cases, the private-social partnership programs started as a form of experimentation with tacit government support. MFs are noted for initiating local-level experimentation and innovation in sustainable forest management. Also, both programs built on the established administrative structure and networks and trust that the MFs had built with stakeholders from government, local forestry groups, and foresters. Interestingly, both MF organizations had their offices shared with government forestry offices. Thus, the established networks, support from government, and commitment to innovation, experimentation and collaboration, were critical to the impacts generated by the MFs. These factors would continue to be critical to the long-term sustainability of the programs. However, other factors such as continuous innovation and adaptation to program changes and stakeholder demands, broadening stakeholder participation, particularly of less powerful and less representative actors, reducing in power asymmetries, and diversifying sources of funding would be key to the effectiveness and long term-sustainability of the private-social partnership arrangements discussed in this thesis.

### 5.4 Conclusions and Suggestions for Future Research

This thesis examined the contributions of bridging organizations, i.e., MF organizations, towards governance for the sustainable management of small-scale forests. Specifically, the research examined how MFs facilitate private-social partnership arrangements to improve governance for the sustainable management of small-scale forests. The thesis adopted a case study approach involving two MF cases, the EOMF from Canada and the KMFA from Japan, to illustrate how different forms of private-social partnership arrangements can contribute to the sustainable management of small-scale forests. The thesis also adopted a mixed method

approach involving surveys, interviews, field observations and document review, with each providing a distinctive evidence to either compliment, reaffirm or fill in the gaps of the other.

Using different analytical frameworks, the research examined the effectiveness of BOs in convening private-social partnership arrangements to align with the dynamic local social conditions and improve the effectiveness of governance arrangements towards the sustainable management of small-scale forests. First, through the lens of social fit, this research (Chapter 2) examined how the KMFA as BO facilitated the transformation of underutilized forest landscapes in Kyoto, Japan. The findings showed that the KMFA initiated diverse governance mechanisms to improve social fit. The improvement in social fit enabled the KMFA to broaden the participation of different actors with novel connections to local ecosystems and thereby enhanced human-ecosystem interdependence. Specifically, improvement in social fit enhanced collaboration across sectors and levels to support local self-organizing capacities to access, utilize and manage the ecosystem. The findings of this thesis provide evidence of the efficacy of BOs to recouple human-ecosystem relationships and improve the fit of governance effectiveness in underutilized social-ecological systems.

Second, drawing from the broader literature on market-based ecosystem governance arrangements, this thesis (Chapter 3) examined the role and effectiveness of the EOMF in promoting the effective participation of NIPFOs in forest management certification in Ontario, Canada. To assess effectiveness, the research investigated how the roles of the EOMF enhanced landowner participation, reduced transaction costs, and improved environmental outcomes. The findings highlighted that across all phases of the certification program, the key attributes that enabled the EOMF to perform effectively were its ability to: build social capital and run the certification at a relatively low cost, align program goals to local landowner needs and interests and innovate to respond to program changes and stakeholder demands. The findings also showed that the EOMF's familiarity with the local socio-ecological system enabled it to spatially target areas where conservation efforts were needed most. Thus, the findings of this thesis provide evidence of the specific intermediary roles that contribute to better enhance landowner participation in market-based ecosystem governance arrangement.

Beyond demonstrating how BOs operate to improve the effectiveness of private-social partnership arrangements and enhance socio-ecological sustainability, this thesis also provides a new perspective on how the well-being of small-scale forest actors can be enhanced. The emerging research in many small-scale forest communities, particularly in the global north,

suggests significant social and ecological changes in such systems (see Wiersum et al., 2005; Cote et al., 2017) that affect local ecosystem management capacity, ecosystem functioning, and local dimensions of human well-being. Yet, few governance interventions have successfully been implemented to address these changes. Drawing on forest values, ecosystem services, and capabilities concepts, this thesis (Chapter 4) enriches understanding on how voluntary landscape-level governance initiatives such as MFs can improve social capacity to enhance ecosystem functioning and improve human well-being in small-scale forest communities. The thesis used multiple sources of evidence to comprehensively identify forest values held by multiple forest actors across both study sites, thus improving the rigour of the findings. The thesis highlighted that to enable multiple actors realise the values they held, both the EOMF and KMFA used different institutional arrangements to generate capabilities – both individual and collective – and thereby improve well-being. Specifically, these capabilities were related to improvements in forest livelihoods and activities, provision of knowledge and technology, improvement in voice in decision making, and facilitation of relationship building and coordination. Based on these findings, this thesis demonstrated that voluntary landscape-level governance arrangements such as MFs have huge potential to address the lack of social capacity in small-scale forest communities in the global north. Particularly, MFs focus on drawing from different institutional arrangements – market, state and local systems – enabled multiple actors to contribute to the governance process while pursuing multiple held values. The synergistic achievement of multiple values – socio-cultural, ecological and economic – improved different constituents of local well-being and provided motivation to conserve these systems for current and future generations. Thus, a capabilities approach through the MF concept provides important pointers not only on how to advance the social component of sustainability for specific groups but also how to transition towards sustainability. This is because both approaches highlight the rights and duties of people to sustain and benefit from nature.

In addition to the key findings highlighted above, this thesis provides several opportunities for future research. First, the findings of the thesis suggest the need for continuous assessment of the socio-ecological changes being witnessed in MF landscapes. The MF landscapes studied embody diverse human-ecosystem relationships but are also subject to complex social and ecological patterns and processes, often operating at larger spatial and temporal scales. Hence, MF landscapes need to be understood as socio-ecological system landscapes. As socio-ecological system landscapes, there is the need for continuous monitoring of the values embedded within MF landscapes, how these values influence new meanings of MF

landscapes, and the implications for the future management of MF landscapes. Future research could focus on integrating social and natural science methods to catalogue the complex social and natural patterns and processes operating in these landscapes. Such knowledge can boost understanding and ability to manage MF landscapes effectively.

Second, some aspects of the findings from this thesis were consistent with observations in the literature suggesting that forest ownership and values in small-scale forest communities in the post-industrial world have become more diverse (see Nordlund and Westin, 2015; Côté et al., 2017). Beyond these, the thesis further showed that as the diversity of actors and values in small-scale forest communities increase, a new challenge emerge, a reduction in practices and systems favouring collective capacity to respond to changes in the ecosystem. Factors such as less direct dependence on the ecosystem and the emergence of new owners/actors with limited management knowledge and who tend to live far away from the ecosystem are the basis for the reduced collective capacity to manage these systems. Yet, this challenge has not received much research attention. Hence, future research needs to find new and innovative ways to align governance arrangements to the social changes being witnessed in these systems. On this, the thesis demonstrated that voluntary landscape-level governance arrangements, such as MFs, hold potential to address this governance challenge. However, the existence of power asymmetries and the exclusion of other actors, such as women landowners, highlight issues of inequity in the MF governance process. Thus, MFs need to address the lack of adequate representation of women land owners in these systems. This is particularly important because previous studies have shown that women landowners in small-scale forest communities are less engaged by conservation agencies (Petrzelkaa, et al., 2018). Thus, this research joins calls echoed by other researchers (see Petrzelkaa, et al., 2018; Butler et al., 2018) for governance organizations to develop strategies to identify and engage better with women landowners.

Third, although findings from this thesis provided evidence that BOs can enhance the effective participation of NIPFOs in market-based ecosystem governance arrangement such as certification, more research is needed to understand how the participation of NIPFOs can be sustained in the long-term. This is because while the BOs studied prioritised organizational and financial sustainability through cost saving measures and inclusion of relatively large landholders in the long-term, the furture impacts of these measures, especially on the participation of small landowners, are not yet known. Thus, more research is needed to examine how the implementation of cost saving measures to achieve financial and organizational sustainability hinder or improve the participation of small-scale landowners.

Fourth, the thesis also demonstrated important networking roles that MFs play in facilitating the effectiveness of MLG arrangements for the sustainable management of small-scale forests. Hence, future research could employ social network analysis to deepen understanding of the functional and collaborative linkages fostered by the MFs. Social network analysis is derived from a social relational theory (McDowell, 2012) and provides information on ‘‘human and system behaviours by investigating how patterns in social relations among actors within a system enable or constrain actors and processes” (Bodin et al., 2011, p. 7). According to Schnegg (2018), despite the significant potential social network analysis can offer in explaining institutional development and natural resource management, its widespread use is only beginning to emerge. The MFs examined are embedded in complex collaborative and functional relationships – both horizontal and vertical – involving different levels of government and sectors of society. Therefore, future research on MFs could benefit from a network analysis to explain how information, knowledge, power, and resources are held and distributed, and how actor’s position and align themselves and their interests within the MF network.

In conclusion, it is important to state that BOs such as MFs have their limitations – including constraining social and institutional context (He et al., 2015), reinforcing existing power structures and potential to perpetuate inequality (Cook et al., 2017; Klenk et al., 2013), and dependence on donors (Crow and Banks, 2012), and instability in funding (Huber-Stearns et al., 2013) - some of which came up in this thesis. Yet, in the midst of the persistent and complex environmental problems and the lack of leadership and the legitimacy crisis facing traditional governance institutions, the role of BOs in navigating the complex field of governance is ever needed. As has been demonstrated in this study, MFs as BOs are unique. MFs focus on multi-stakeholder building, voluntary partnerships, and commitment to experiment, innovate and share knowledge. Also, the support and legitimacy MFs enjoy from multiple sectors and levels of society within specific socio-political spaces makes them important governance to the broader question of multi-level environmental governance. These attributes suggest ongoing research attention to MFs can support better understanding and advancement of sustainable forest management.

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# LIST OF APPENDICES

## APPENDIX A: Socio-Demographic Characteristics of Respondents in the KMFA and EOMF

Table A.1: Socio-demographic characteristics of respondents in the KMFA (N=41)

| **Background of survey respondents** | **Frequency** | **Percentage** |
|---|---|---|
| Category of respondents | | |
| Citizens groups | 5 | 12.2 |
| Forest volunteers | 13 | 31.7 |
| Private corporation | 19 | 46.3 |
| Individual forest owner | 3 | 7.3 |
| Local government | 1 | 2.4 |
| Gender of respondents | | |
| Male | 39 | 95.1 |
| Female | 2 | 4.9 |
| Age of respondents | | |
| 18-24 | 1 | 2.4 |
| 25-34 | 1 | 2.4 |
| 35-44 | 10 | 24.4 |
| 45-54 | 8 | 19.5 |
| 55-64 | 8 | 19.5 |
| 65+ | 13 | 31.7 |
| Ownership of forests | | |
| Yes | 13 | 31.7 |
| No | 28 | 68.3 |
| Size of forest owned | | |
| up to 10 ha | 6 | 14.6 |
| 11-20 ha | 2 | 4.9 |
| 31-40 ha | 1 | 2.4 |
| Above 50 | 4 | 9.8 |
| NA | 28 | 68.3 |
| Forms of communication with KMFA* | | |
| Participation in conferences | 21 | 51.2 |
| Emails | 26 | 63.4 |
| Brochures | 15 | 36.6 |
| Forest owner associations | 6 | 14.6 |
| Newsletter | 9 | 22 |

| | | |
|---|---|---|
| Through forestry consultants | 2 | 4.9 |
| Facebook/twitter | 3 | 7.3 |
| Telephone | 5 | 12.2 |

Table A.2: Socio-demographic background of respondents in the EOMF (N=66)

| **General characteristics of survey respondents** | **Frequency** | **Percentage** |
|---|---|---|
| Gender | | |
| Male | 55 | 83.3 |
| Female | 9 | 13.6 |
| Undisclosed | 2 | 3.0 |
| Proportion of respondents self-declared as aboriginal | 2 | 3 |
| Age | | |
| 25 - 34 | 2 | 3.0 |
| 35 - 44 | 3 | 4.5 |
| 45 - 54 | 7 | 10.6 |
| 55 - 64 | 23 | 34.8 |
| 65+ | 31 | 47.0 |
| Highest level of Education | | |
| High School Graduate | 1 | 1.5 |
| Technical School or Community College | 11 | 16.7 |
| Some University | 4 | 6.1 |
| Undergraduate University Degree (Bachelors) | 22 | 33.3 |
| Some Graduate Studies | 6 | 9.1 |
| Graduate University Degree (Masters, Doctorate) | 22 | 33.3 |
| Ownership of forest land | | |
| Yes | 52 | 78.8 |
| No | 14 | 21.2 |
| Size of forestland owned | | |
| Up to 10 ha | 10 | 15.2 |
| 11 – 20 ha | 10 | 15.2 |
| 21 – 30 ha | 5 | 7.6 |
| 31 – 40 ha | 7 | 10.6 |
| 41 – 50 ha | 6 | 9.1 |
| Above 50 | 26 | 39.4 |
| Membership of Groups | | |
| Woodlot owner’s association | 44 | 66.7 |
| EOMF certification working group | 21 | 31.8 |
| Maple syrup producer | 8 | 12.1 |
| Community forest manager | 5 | 7.6 |

| | | |
|---|---|---|
| Private forest manager | 11 | 16.7 |
| Private woodlot owner | 25 | 37.9 |
| Others[9] | 10 | 15.2 |

[9] Previous woodlot owner, environmental scientist, government program manager, stewardship council and conservation authority, Board of EOMF

## APPENDIX B: Source and Types of Document Analysed

Table B.1: Sources and types of document analysed from the KMFA*

| Type of document | Key information analysed | Source |
|---|---|---|
| Forest management reports of 34 private corporations spanning a period of 5 - 10 years | The forest management goals of private corporations; types of activities undertaken, and challenges and outcomes reported. | KMFA website: http://www.kyoto-modelforest.jp/works/works-266/ |
| Organizational, operational and historical profile of the KMFA | History of the formation, membership categories, and projects and activities are undertaken. | KMFA website: http://www.kyoto-modelforest.jp/ |

*These materials were accessed between February 2017 and June 2017.

Table B.2: Sources and types of document analysed from the EOMF*

| Type of document | Key information analysed | Source |
|---|---|---|
| Public summary of audit report on certification program from 2004 – 2016. | Roles of EOMF, stakeholder concerns, non-conformance to certification principles and changes to program requirements | FSC Canada website: https://info.fsc.org |
| Organizational, operational and historical profile of the EOMF Certification Program | History of the certification program design, principles and guidelines for forest certification program, types of forest management plan, and projects and activities undertaken. | EOMF forest certification website: http://www.eomfcert.ca/ |

*These materials were accessed between February 2017 and June 2017.

Table B.3: Activities and events attended/participated in Kyoto

| Participant observations | Date and location | Details of event |
|---|---|---|
| Forestry Conference and Model Forest Symposium | February 5th, 2016 Kyoto | Model Forest Symposium took place on the side-lines of the annual forestry conference. Activities undertaken during the symposium are presentations by private companies and volunteer groups on their activities, challenges and successes and an open forum on opportunities and challenges in MF activity. Awards were also presented to some participants. |

| | | |
|---|---|---|
| Forest utilization and management experiential Field Trip | February 19, Hyogo Prefecture | Field trip sponsored by Kyoto City for forest volunteers to learn about forms of wood utilization and management of plantation forests. About 20 people participated. |
| Bamboo thinning Training session for new forest volunteers | February 20th, 2016, Nagaokakyo City | Experienced forest volunteers provided training and shared experiences to new and potential volunteers. The event was coordinated by KMFA and local a government. About 25 people participated. |
| Forest management activity by citizens groups | March 6th, 2016 Uji city | Bi-weekly forest management activity by a volunteer group. Activity mainly involved wood-chopping experience. Participants were 18. |
| Private company forest management activity | March 12th, 2016 Nantan City | Management and employees of a private company joined local volunteers to monitor, thin, and harvest firewood and mushroom. Participants numbered more than 30 |
| Forest management seminar | March 14th, 2016, Osaka-city | A forestry specialist with a private company provided a seminar on environmental functions of forest and mountain forest management for all interested members of KMFA. |

APPENDIX C: Examples of human-nature connections mentioned by participants involved in local forest management (1 indicates intrinsic motivations. 2 indicates extrinsic motivations).

| **Category of human-nature connection** | **Specific motivation** | **Explanation** | **Source** |
|---|---|---|---|
| Cognitive | Building on previous experience, or connection to forest landscapes[1] | Place values from previous experience of local practices related to personal (childhood experiences in rural areas) or community forest biographies (protecting forests planted by close relatives) inscribed on rural village landscapes, emerged as an important motivation for local stakeholders such as citizens groups and forest volunteers. | Group interviews with forest volunteers. Observations from conference presentations |
| | Employee satisfaction[2] | Private corporations stated that their participation in forest management helps to build employee satisfaction, including boosting their morale. | Individual Interviews with representative private corporations. Observations from conference presentations. Document review. |
| | Re-establishing forest values as 'clean and bright and desirable place'[1] | Participants from all sectors shared a common perspective that forest landscapes need to be 'clean and bright and a desirable place for people. | Group interviews with forest volunteers. Observations from conference presentations. Forest management reports. |
| Emotional and Experiential | Learning, having fun and connecting with nature[1] | Participants, particular representatives of private corporations and their staff, perceived forests as places for recreation, sites of learning about culture and environment and connecting to nature. | Document review. Observations from conference presentations. Observations from participation forest management activities. |

| | | | |
|---|---|---|---|
| | | | Forest management reports. |
| | Networking[2] | Citizens and volunteer groups specifically mentioned that they participate because it helps them to meet new people including building contact with urban people. | Interviews with leadership volunteer and citizens groups. Group interviews |
| | Engagement in physical activity[2] | Participants from all sectors indicated forest management activity provides an opportunity to engage in physical activity. | Forest management reports. Group Interviews with forest volunteers. Observations from participation in forest management activities. |
| Philosophical | Contributing to something meaningful[1] | Participants from all sectors indicated the joy of being involved in direct forest activity roles such as pruning and thinning, making forest roads, and harvesting mushrooms. | Document review. Interviews and Group Interviews |
| | Contribution to society and the environment[1] | Participants from private corporations advanced a shared understanding of the need to give back to society through involvement in the protection of biodiversity, combating global warming, and protecting water resources. | Forest management reports. Individual Interviews with representatives of private corporations |
| | Boost public image and build societal trust[2] | Representatives of private corporations opined that contribution to forests management helps to boost their public image (e.g., oil firms) and build trust with the public. | Individual Interviews with representatives of private corporations |

Source: Summary of themes from interviews (group and individual) and document review

APPENDIX D: Satisfaction with the KMFA governance instruments and processes as expressed in surveys of participants

| | **Completely dissatisfied** | **Somewhat dissatisfied** | **No opinion** | **Somewhat satisfied** | **Completely satisfied** |
|---|---|---|---|---|---|
| Promotes the participation of residents in decisions on forest management | - | 9.8 | 2.4 | 46.3 | 41.5 |
| Offer training and technical guidance on forest management activities | 4.9 | - | - | 43.9 | 51.2 |
| Provides knowledge and information on forest management | - | 2.4 | - | 39.0 | 58.5 |
| Strengthen relationships between forest owners and Prefectural government on forest management | - | 2.4 | - | 46.3 | 51.2 |
| Strengthen relationships between forest owners and non-forestry private companies on forest management | 4.9 | 9.8 | - | 68.3 | 17.1 |
| Provide funding for forest management | 2.4 | 9.8 | 46.3 | 22.0 | 19.5 |
| Support diversification of products and services (e.g., tourism etc.) | 17.1 | - | 17.1 | 53.7 | 12.2 |
| Promotes the participation of wood processing firms | 41.5 | 9.8 | 46.3 | 2.4 | - |
| Promote participation of women | 7.3 | 26.8 | 19.5 | 34.1 | 12.2 |
| Ensures mutual respect and equality at forestry meetings | - | 12.2 | 17.1 | 28.9 | 41.5 |
| Promotes fairness between local foresters and private corporations | - | 12.2 | 17.1 | 53.7 | 17.1 |

APPENDIX E: Characteristics of participants involved in the certification program

| | **Frequency** | **Percentage** |
|---|---|---|
| Gender | | |
| Male | 35 | 83.4 |
| Female | 6 | 13.6 |
| Undisclosed | 1 | 3.0 |
| Age | | |
| 25 - 34 | 1 | 3.0 |
| 35 - 44 | 2 | 4.5 |
| 45 - 54 | 4 | 10.6 |
| 55 - 64 | 15 | 34.8 |
| 65+ | 20 | 47.0 |
| Highest level of Education | | |
| High School Graduate | 1 | 1.5 |
| Technical School or Community College | 7 | 16.7 |
| Some University | 3 | 6.1 |
| Undergraduate University Degree (Bachelors) | 14 | 33.3 |
| Some Graduate Studies | 4 | 9.1 |
| Graduate University Degree (Masters, Doctorate) | 14 | 33.3 |
| Ownership of forest land | | |
| Yes | 33 | 78.8 |
| No | 9 | 21.2 |
| Size of forestland owned | | |
| Up to 10 ha | 6 | 14.3 |
| 11 – 20 ha | 6 | 14.3 |
| 21 – 30 ha | 3 | 7.1 |
| 31 – 40 ha | 5 | 11.9 |
| 41 – 50 ha | 4 | 9.5 |
| Above 50 | 18 | 42.9 |

# APPENDIX F: Level of satisfaction with the capability functions of the EOMF and KMFA

Table F.1: Level of satisfaction with the capability functions of the EOMF

| | **Completely dissatisfied** | **Somewhat dissatisfied** | **Somewhat satisfied** | **Completely satisfied** | **No opinion** |
|---|---|---|---|---|---|
| Freedom and voice | | | | | |
| Promotes local-level actor's participation in decisions on forest management | 1.5 | 6.1 | 27.3 | 48.5 | 16.7 |
| Governance and management | | | | | |
| Helps foster collaboration with Aboriginal peoples. | - | 3.0 | 27.3 | 24.2 | 45.5 |
| Enhances relationships between forest owners and other land/property owners | 1.5 | 9.1 | 21.2 | 50.0 | 18.2 |
| Supports collaboration among forest tenure holders | 1.5 | 4.5 | 27.3 | 43.9 | 22.7 |
| Provides funding to support local forest management activities | 7.6 | 25.8 | 13.6 | 15.2 | 37.9 |
| Knowledge and technology | | | | | |
| Provides opportunities for education e.g., on Aboriginal peoples' forestry values | - | 6.1 | 21.2 | 30.3 | 42.4 |
| Promotes local-level science and research on forestry | 1.5 | 4.5 | 31.8 | 36.4 | 25.8 |
| Provides training and technical support in forest management | 1.5 | 7.6 | 37.9 | 34.8 | 18.2 |
| Provides support to control forest disease | 1.5 | 12.1 | 37.9 | 21.2 | 23.3 |
| Provides support for wildfire management | - | 7.6 | 16.7 | 15.2 | 60.0 |
| Livelihoods and activities | | | | | |
| Supports the development of forest product processing firms (e.g., sawmills) | - | 18.2 | 37.9 | 15.2 | 28.8 |
| Supports the commercialization of non-timber forest products | 3.0 | 4.5 | 37.9 | 12.1 | 42.2 |

Table F.2: Level of satisfaction with the capability functions of the KMFA

| | Completely dissatisfied | Somewhat dissatisfied | Somewhat satisfied | Completely satisfied | No opinion |
|---|---|---|---|---|---|
| Freedom and voice | | | | | |
| Promotes local-level actor's participation in decisions on forest management | - | 9.8 | 46.3 | 41.5 | 2.4 |
| Governance and management | | | | | |
| Strengthen relationships between local forest groups and local government in forest management | - | 2.4 | 46.3 | 51.2 | - |
| Strengthen relationships between local forest group and non-forest private companies in forest management | 4.9 | 9.8 | 68.3 | 17.1 | - |
| Provides funding to support local forest management activities. | 2.4 | 9.8 | 22.0 | 19.5 | 46.3 |
| Knowledge and technology | | | | | |
| Provides opportunities for education e.g., on the environmental functions of forests | 2.4 | 4.9 | 26.8 | 61.0 | 4.9 |
| Promotes local-level science and research on forestry | - | 12.2 | 9.8 | 4.9 | 73.2 |
| Provides training and technical support in forest management | 4.9 | 9.8 | 29.3 | 46.3 | 9.8 |
| Provides support against damage by wild animals to forests | 2.4 | 7.3 | 31.7 | 17.1 | 41.5 |
| Provides support to control forest – disease. | 2.4 | 12.2 | 14.6 | 9.8 | 61.0 |
| Livelihoods and activities | | | | | |
| Supports the development of forest product processing firms (e.g., sawmills) | 7.3 | 14.6 | 4.9 | 7.3 | 65.9 |
| Supports diversification of forest products and services (e.g., tourism) | - | 17.1 | 19.5 | 4.9 | 58.5 |

## APPENDIX G: Summary of reports and documents

Table G.1: Summary of reports on forest management activities by participating private companies in the KMFA

| Firm | Reported activities | Reported Outcomes |
|---|---|---|
| **PF1: Objective:** Forest Conservation activities | sweet potato planting and harvesting; pine reforestation and protection; thinning and natural tree regeneration; herb walking tours with experts; monitoring of planted trees; growing of mushrooms; fungus striking experience; exercise in the woods in collaboration with the health consultants; construction of wooden stairs | • utilization of cut trees from broad-leaved forest for wood products and charcoal<br>• utilization of thinning material for bench and chairs<br>• cooperation with forest volunteer organizations to development sidewalk<br>• tree surveys and forest and environmental learning, construction of sign posts<br>• oyster mushroom fungus striking experience<br>• constructed a hut as storage for helmet and tools<br>*Initially when we started the operations the forest density did not permit light but now it has changed and the forest looks healthy and welcomed, the growth of the undergrowth is proceeding.* |
| **PF2**: **Objective:** Conservation of forest mountain village | weeding of underbrush grass; cypress thinning and pruning; removal of insect damaged trees; construction and maintenance of forest footpaths; forest walks; networking with locals; firewood making and basket knitting; safety training; mushroom harvesting; bamboo shoot digging | • processing of tree branches for firewood and supply to local community<br>• installation of wood bridge<br>• monitoring of bamboo shoots<br>• participation in summer festivals with locals<br>• construction of sign post and meeting and resting place using local wood<br>• construction of flush toilet in community centre to encourage women participation<br>*The forest looks clean and bright - we can now have a visible view of brook that flowed from mountain and opened access to a river in the forest* |
| **PF3: Objective:** Protection of watersheds/sanctuaries | weeding; thinning, pruning, and improvement cutting;<br>tree planting and harvesting; woodworking | • expansion of activities from 94ha to 106ha and from 200ha to 306ha<br>• unveiling of billboards and commemorative tree planting<br>• training of 90 new employees in experiential forest management<br>• using the last year harvested wood to create a coaster and pen stand |
| PF3: **Objective:** landslide prevention during earthquake | bamboo forest thinning; bamboo shoots digging | • bamboo craft experience<br>• constructed footbath that utilize bamboo pellets<br>*The bamboo grove that was dense because of no maintenance when we started five years ago, is now clean beyond* |

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| | | *recognition- bamboo forest light can now reach the ground and now neat beyond recognition* |
| PF4: **Objective:** Conservation of thatched idyllic forest mountain village | tree planting; thinning and pruning of coniferous forest; tree surveys and monitoring; forest and environmental learning; participation in traditional cultural events; mushroom planting with local community; construction and maintenance of forest sidewalk | • supply of firewood to local community centre<br>• construction of 25-step staircase to access the forest<br>• monitoring the growth situation of about 600 pieces of hardwood that was planted<br>• Awarded the Kyoto Ministry of the Environment service award, etc.,<br>• Engagement of Bukyo university in Miyama in preliminary survey of planned thinning site<br>• 40 pieces of raw wood building for mushroom cultivation<br>• harvested mushrooms and shared with local community<br>• planted trees of about 500 pieces of hardwood<br>• constructed protective net against mountain azalea to control deer feeding damage |
| **PF5**: **Objective:** Protection of watersheds/sanctuaries | thinning of pine and artificial forest; tree planting (pine) by employees; environmental learning; mushroom (shiitake) cultivation | • Planted 750 cypress trees, 100 spring cherry and chestnut trees, cherry and oak 400, 420 cypress seedlings<br>• Harvested and utilized wood for crafts and pallets |
| **PF6: Objective:** Forest protection and utilization | thinning of cypress forests | • supply of firewood to local people<br>• utilization of thinned wood for coaster and pen stand |
| **PF7: Objective:** forest conservation activities | Weeding; Thinning; tree planting; forest road construction; nature experience; shiitake mushroom cultivation | • Unveiling of a "Sen Forest" guide signboard<br>• Constructed net of deer measures paste,<br>• shiitake mushroom cultivation and harvesting<br>• Compost making<br>• Used of thinning material to construct chair and table for local community centre,<br>• Tour of the local tea farmers,<br>• The development and selection of biotope sidewalk route.<br>*Five years ago, when we started, the surrounding forest base was dense, but now it has been transformed into a forest with advanced maintenance and enough sunlight at the bottom* |
| **PF8: Objective:** Protect and nurture the forest | tree planting and nursery activities, | • Tree planting has been completed (about 300 oak, oriental oak, top Miyazu cedar, and cypress)<br>• Promoting natural regeneration of native trees in the |

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| | | • weeding and planting of hydrangea<br>• the maintenance of sidewalks and stairs in the park |
| **PF9: Objective:** Protection of watershed | • Tree planting<br>• mowing, thinning, and weeding<br>• boardwalk maintenance<br>• protection of natural reaerated trees<br>• forest and environmental learning<br>• Tree surveys and bird-watching<br>• Installation and maintenance of net around<br>• long sickle usage training | • the unveiling of the sign post<br>• Planted about 50 lines of Acer palmatum<br>• bamboo clearing and mowing of the foot of the mountain<br>• construction and maintenance of sidewalks<br>• observed deer damage to planted trees and implemented deer damage prevention measures<br>• safety training for employee volunteers and successful completion without any injury<br>*We are learning all the time as our activities continue. About 51 pieces of maple trees that was planted six years ago, when we first started and was damaged by deer has been successively replaced in those larger Bojuu net.* |
| **PF10: Objective:** Conservation of forest mountain village | • employee exchange meetings and forest learning<br>• thinning of broad-leaved trees,<br>• tree planting<br>• grass cutting<br>• restoration work of typhoon damage<br>• woodworking | • Planted about 100 hardwood trees such as quercus, chestnut, and zelkova<br>*We divided ourselves into two groups; one to do bamboo undercutting and the other constructed sidewalks. I really enjoyed the physical activity as I sweat comfortable. It is very healthy and nice in the woods- and it was a fulfilling two days*<br><br>*After working in the woods, we held an exchange meeting with the residents - reports on our environmental conservation efforts were provided and- we had dinner together…. and it seems that friendship among locals and employees was deepened and the momentum for the future activities increased.*<br>*We carried out mowing and the maintenance site of "buffer zone" which was carried out in the southern village together with the residents, and we were extremely pleased working together with the residents.* |
| **PF11: Objective:** Forest Conservation and utilization | • Tree planting<br>• Forest maintenance activities - thinning and undergrowth cutting, etc.<br>• experience woodworking classes for parent and children<br>• planting trees such as hardwood forests | • Since 2011, training using the Shimadzu Forest as part of new employee education<br>• Invitation of external experts to learn the knowledge of forest vegetation, and damage by animals to forests<br>• implementing the woodworking classes for children<br><br>*Through the employee forestry training activity, I realize that employees' awareness of forest conservation is improved and* |

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| | • environmental learning | *communication with people in the area is revitalizing. I would like to continue working with local communities in the future*<br><br>*It is nice to be out in the forest. The lunch was a fun during the autumn activity - while eating rice balls and vegetables using local rice and vegetables. From the afternoon, the children used to work with branches of trees, hide in the cypress and spend happy in nature.* |
| **PF12: Objective:** Conservation of forest species for traditional fire festival | • thinning for employees and other interested parties<br>• secure and nurture pines and broad-leaved trees to be used for firefighting of Goyama | *We harvested and supplied Konbanomitsuna as a firewood for "capital Goyama firewood festival" and red pine as for firewood and "Kurama horse festival" torch for torches*<br><br>*We cultivated the materials of firewood and torches necessary for the capital of Morijiyama and the fire festival of Kurama horse.*<br><br>*Under the autumn sky, the participants experienced a comfortable sweat and the interior of the forest brightened considerably. It seems that it might be one step closer to the environment where Kobanomitsu bamboo and Pinus densiflora are easy to grow.* |
| **PF13: Objective:** Conservation of bamboo forest | • Maintenance of bamboo groves,<br>• Maintenance and planting of broad-leaved trees<br>• Environmental learning | • Approximately 20 members, family members, and Girl Scout members participated in outdoor fellowship activities.<br>• Field learning of the natural environment<br>• Making sweet potatoes and playing in the forest.<br>*All the participants have cooperated very well and that has led to success. The forest was in a state where no one could enter when we started in 2008. Currently it has become a green forest, with clear view of mountains – now the forest is in a shape where children can play and plant trees.* |
| **PF14: Objective:** Conservation of bamboo forest | • Logging of bamboo and cypress<br>• Making seedlings for tree planting<br>• Making firewood<br>• Making bamboo fences<br>• Establishment of forest conservation signpost<br>• Nature observation | *On the day of the event, 70 people, including employees of KDDI Corporation and their families, and local people worked on bamboo groves – adults worked on bamboo crafts and children did acorn work (for children) etc. It was an intense activity and was refreshing and people sweated.*<br><br>*From the afternoon, we made bamboo flute, bamboo dragonfly, acorns pots, flower bowls etc. with free manipulation using bamboo. In addition, we made part of wild animal invasion prevention fence such as wild boar on the* |

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| | • Promotion of utilization of thinned timber bamboo timber | *planned bamboo grove field within the activity area using logged bamboo -The participants experienced good feeling while enjoying nature and brought back fresh bamboo shoots (November 17)*<br><br>*Employees of KDDI worked with forest volunteer groups and local residents to make firewood and bamboo fences. A total of about 60 people participated in the project. Efforts on effective utilization of bamboo materials were implemented; including trees that were cut last year to carry out firewood, make fence and bamboo dragonfly. For lunch, we made curry and rice using local ingredients and it was a fulfilling day.*<br><br>*On the day, a total of 142 participants including the KDDI employees, group company employees, partner companies and their families, Ryukoku University, and staff. We felled unnecessary bamboo and thinning of cypress trees shielding the light to the surface and rapidly decreasing many plants and insects.* |
| **PF15: Objective:** Forest Conservation activities | • Thinning using the funds provided by the club<br>• Commemorative tree planting of hardwoods<br>• Environmental learning | *In this activity, we made firewood as a utilization of logged shi. A part of the firewood that we made is donated to the local nursery school. The remaining firewood is sold, and we plan to donate the proceeds to the shrine for maintenance expenses.* |
| **PF16: Objective:** Water conservation | • Pruning and thinning of artificial forest,<br>• Maintenance of hardwood forests and red pine forests<br>• Woodworking,<br>• environmental learning etc.; | *On the day, it was a cold day but 41 people participated and in the morning, we undercut the undergrowth and cutting down shrubs under the guidance of the Kyoto Forest Instructor Association;*<br>*We cut bamboo that inhibits the growth of "red pine forest" and brought all the harvested bamboo shoots out of the forest. In the afternoon, I enjoyed bamboo work using local bamboo and a walk around the pond. -I made "my chopsticks" and "cups" with bamboo craftsmanship.*<br><br>*On our anniversary day, 60 people participated in the "Ide-machi rich green and clear stream. we held an environmental learning society jointly with the Omron Trade Union Kyoto Branch. Although it was a rainy-day* participation was 30 people including "Ide-machi greenery and clear stream |

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| | | protection council". At the lecture, we learned handling of tools, significance to advance forest maintenance.<br><br>*We got a professor on safety work from the Kyoto Forest Association. We climbed steep slopes of red pine forest and carried out "undergrowth weed" and "thinning" with guidance of local staff. The thinned wood was crushed by a crusher and made into fertilizer. As the forest conservation work was carried out by many participants, the scenery of the forest of the red pine (Pinus densiflora) in the park was greatly improved.* |
| **PF17: Objective:** Forest Conservation activities | • Thinning, clearing, weeding, etc.<br>• Improvement cutting, thinning, weeding, planting trees, charcoal making, etc.<br>• construction of deer fence,<br>• grass cutting<br>• forest road clearing | Approximately 100 people and 20 staff members participated including, employees and their families. It was impressive that the average age of the people gathered was about 30 years old and everyone was young and was proceeding with work of forest maintenance enthusiastically. I got explanations about the work from the forest instructor, we did underbrush clearing and tree planting around the Taisho pond. Although it was a clearing work on a steep slope, the water surface of Taisho pond could be seen through the trees.<br><br>*After the day's work with thinning and cutting, the small trees and branches were chopped together to make compost for the farmers in the locality and the rest are burned into charcoal separately. We often use the charcoal to roast BBQ for employee's family members and the community during the get together.*<br><br>*Veteran employees, mainly salespeople, worked thinning, clearing and pruning on the slopes of the mountains, and with their hands. Many of the employees consider the intense activity as good for their health. after the activity, it became a beautiful mountain to be able to observe and I was able to enjoy a very pleasant sense of accomplishment (May 14, 2016)* |
| **PF18: Objective:** Forest Conservation activities | • Tree planting and mowing of hardwoods<br>• maintenance of sidewalks<br>• Environmental learning etc. | *On that day, after the lecture on clearing of broadleaved trees I was sweaty for making logs for shiitake cultivation and to support regeneration of red pine forest. .....I am looking forward to delicious shiitake mushrooms.*<br><br>*From the afternoon, men continued to develop hardwood trees, children and women made accessories using twigs. We are* |

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| | | *finished activities safely in a spirited atmosphere in sweating. Some were unsatisfied because there was more to be done before we could see the scenery of Arashiyama.*<br><br>*On the day, under the guidance of the Kyoto Osaka Forestry Administration Office and officials of the prefecture, the men team developed sidewalk improvement using mulberry and scoops and logging of large trees while the women and children cut logs of small diameter trees around the sidewalk. I was in charge of mowing and the sidewalk from the ridge to the foot and it lasted for about an hour and a half (Nov 8, 2014).* |
| **PF19: Objective:** Forest Conservation activities | • Tree planting by employees and their families<br>• Organization of hardwoods<br>• Thinning of artificial forest etc. | *Aiming for a healthy forest, we collaborated with employees of Omron and Ayabe City, and Kyoto* P*refecture. This activity mainly focuses on thinning of sugi tree plantation forest and working sidewalk within broadleaved forest, and next spring we are planning to conduct a wide range of activities such as cultivation of mushrooms with fallen trees. (Nov, 2010)*<br><br>*The forest was also rough with the other day typhoon, but work has progressed beyond what I thought, so I think if you looked at the scenery after the work ended, there were more people who got a sense of accomplishment that they did. After finishing work, we shared shiitake mushrooms with everyone. It's such a good to be served with the mountain foods (Nov. 2013)*<br><br>*We held forest our eleventh forest conservation activities in Oku Forest in Ayabe City, Kyoto Prefecture. This time, a total of 43 employees and their families participated. We cut down the Sugi and undergrowth and made a wooden horse for raising Shiitake mushrooms. In addition, the forest trail that was blocked due to the typhoon has been cleaned to make it easier for people to enter. Although it has become a passage and playground for boars and deer, it has also become a Satoyama where people enter easily (Nov 8, 2014).* |
| **PF20: Objective:** Forest and bamboo conservation | • Tree planting<br>• Nature observation<br>• Thinning of artificial forest etc. | I went into the forest and realized nature. After work, we took lunch with homemade pork juice at the site. It was a half day and participants could refresh mind and body in the clean forest. |

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| | | We conduct activities every month and we are scheduled to produce shiitake mushrooms next time (may, 2010);<br><br>On April 7th, new employee training was held in Camigg Forest. After receiving lectures on the work of forests, I understood the significance of model forest activities. Every one of the new employees worked on bamboo forest maintenance. Most of the people were first time participants but we worked together well and it became a beautiful bamboo forest.<br><br>Many members participated for the first time, and the number of females also became the largest number of people with 8 people.<br>On that day, after explaining the situation of Nishiyama's efforts to improve forests and the purpose of the activities, we were divided into 4 groups for approximately 1 hour, and the maintenance of hardwoods and bamboo forests was carried out. It was a short period of time, but the forest that people could not enter was improved and participants seemed satisfied with the result. |
| **PF21: Objective:** Reforestation and conservation | • Hardwood planting,<br>• lower cutting Maintenance of hardwood and bamboo forests, Environmental learning<br>• Removing undergrowth and protection net | The trees planted are Megusinoki and Irohamomidji, both of which are native to the Eiwa area. Employees worked with the cooperation of the people of the Eiwa district to undertake replanting. On the day, Mayor Sasaki Nantan also got involved and I felt the expectation of "creating forests for corporate participation" (Nov 2009)<br><br>*We undertook mowing on the site we planted last year in August. However, following the request from local people, we will thin and replant around Susuki, the mountains surrounding the temple near We expect to continue and coordinate maintenance of hardwood well into the future, based on local intention because we have learnt that it always ideal to involve the local people (Sunday, 7th November).*<br><br>*I am looking forward to seeing the trees growing steadily every time. In the past few years, seedlings were eaten by deer, but future growth is expected because of the protective fence that we have built now. About autumn, we plan to re-plant seedlings eaten by deer (May 2015).* |

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| | | *It was a tree planting work in a rainy season. We planted 26 seedlings of cherry, maple, dogwood etc. Since the workers of the local forestry association had been prepared in advance, work was done very smoothly compared to before. After the work was completed, we had a social gathering at the public hall with local people. We have agreed together with the forestry association to mow the lower grass around May next year. I'd like to look forward to the growth of the planted trees (Nov, 2015).*<br><br>*During the tree planting work, last year, forestry associations improved forest roads…. Saplings such as dogwood, Irohamomidji, and weeping cherry trees planted in November last year were growing smoothly, so we were relieved without damage such as by deer (May 2016).* |
| **PF22: Objective:** Forest Conservation activities | • Maintenance of broadleaf forests<br>• effective utilization of logged trees<br>• Pruning of coniferous forests,<br>• thinning and effective utilization of thinned timber<br>Planting trees such as hardwoods<br>• Pavement improvement etc.<br>• Forest and environmental learning such as tree research and wild bird observation<br>• Participation in regional events etc., cooperation | In the past, it is a forest that has provided a lot of grace, such as good landscapes, matsutake mushrooms, clean water, etc., due to the vegetation of red pine and broad-leaved trees. Our plan with the local people is to restore and make the forest clean. Here, we will conduct maintenance, etc. of hardwoods, sidewalks improvement and environmental learning.<br><br>We have planned five times of forest conservation activities over the last five years in the "Asahi no Mori", and 320 cooperative members and staff have participated so far. Activities involves the improvement of work roads, forest exploration societies, the utilization of logging trees, construction of sidewalks and maintenance of broadleaf forests carried and logging through the support of the Kyoto Forest Instructor Association. From the participants, positive opinions and requests such as "I was able to refresh both mentally and physically" and "I want to work with children and family members" were issued;<br><br>We have learnt a lot about forests that have changed our attitude to the forest. The forestry instructor's message said, "By knowing vegetation, I want you to feel the history of the forest and the thoughts of the forests that the predecessors have nurtured". This enabled me and many other participants to reflect on our childhood experiences and enjoyed knowledge |

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| | | on the forest. I was able to deepen my interest and support for our forest.<br><br>The thinning work was divided into two groups at the observation deck and the summit plaza, and when the work ended, both forests were finished well at the end of the work. People from the local Mitamata mountain union also participated in the activities and deepened exchanges with staff and union members of the cooperatives who participated as volunteers (Oct 2010).<br><br>Three groups of forest instructors cooperated and divided into three groups and entered Yuya mountain. With the instructor, we climbed the mountain path while listening to the names and features of the trees. It is a road that I have been climbing silently to work so far but I got a very fresh feeling knowing that each tree has a name and each has its own characteristics and differences. I could learn something familiar such as "Hiragi" and "Hinoki", "Soyogo" "Takanoyashi" "Mouse sting" "Torsion". Next time, I have more fun to enter the mountain (Nov. 2010).<br><br>When I started working, it was a daunting forest, but as the work progressed, the sky gradually expanded and brightened. By clearing the cut trees, I saw the young trees of the red pine tree exposed to sunlight, and they were lovely with determination.<br><br>Bonfire and cooked pork soup were prepared on the site, and with each person surrounding the bonfire, an exchange meeting was held while taking lunch that. We received presentation of impressions from 5 working groups including from the Kyoto Prefectural University Forest Volunteer Circle 'Mori Nakama'. We learnt a lot about the forest and had fun announcing the impressions of all five groups, and the site of interaction was exciting. |
| **PF23: Objective:** Woodland conservation | • Maintenance of broadleaf forests<br>• Effective utilization of logged trees and bamboo | In the Ogata district, we are working on forest making utilizing the vegetation such as Mitsuba rice straw, and so on, eventually we are making improvements to the walkway so that local people can enjoy the walks (Nov. 2012). |

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| | • Tree planting<br>• Maintenance of bamboo forest<br>• Forest Sidewalk maintenance<br>• Environmental learning<br>• Wild bird observation<br>• Participation in regional events | In the Kagejya district, we are working on clearing of bamboo spreading in coniferous forests, maintenance of neglected bamboo groves and thinning. I am learning the importance of protecting the function and landscape of bamboo groves by adding human hands (June, 2010).<br><br>On the day, we first learned about "significance of forest conservation activities" and "safe work way". Then we walked around the activity site by the guidance of the local people and conducted the overview and boundary check of the forest. While I was sweating, everyone went out for lunch box under the clear autumn sky, and local people told us about the current state of forests in the area. In the afternoon, we first removed the withered pine that blocks the sidewalk, cutting of hardwoods and thinning of Japanese cypress forests and then it became a clean and bright forest (Nov. 2010)<br><br>In today's activity, 15 employees and their families participated and carried out "The 6th Kyoto Model Forest Campaign in Ayabe". In this activity, we made forests of Mitsuba rice straw which made use of vegetation in a forest in the Obata district. First, as a starting point, improved the sidewalks and eventually plan to develop a pathway as walkways so that local people can explore the forest (Nov, 2013).<br><br>Before starting work, we listened to the conditions of the forest, the functions of the forest, the significance of the work to be done from now on, the work precautions, etc. The main work involved cutting down the bamboo that has infested the cypress forest in Ayabe City Kagejya area.<br><br>We conducted the 22nd activity and 19 employees and their families participated and carried out the mushroom sterilization to produce the shiitake mushrooms on the last oak trees that were harvested at "Satoyama Ayabe", followed by unwanted bamboo logging. The harvested bamboo is processed effectively into bamboo charcoal for use (April, 2016) |

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| **PF24: Objective:** Forest utilization and conservation | • lower grass cutting, thinning, planting, weeding,<br>• Chestnut, plum, cherry blossom planting<br>• fungus stripping,<br>• utilization of thinned timber<br>• Sidewalk maintenance<br>• Forest, history learning and nature observation | With satisfactory autumn sky, 47 people worked under the guidance of the Nantan Broad Promotion Bureau, Nantan City, Nanboku Hirose Production Forest Association, Yagi Town Forestry Association. After completing the work, everyone participated in the local rice cake baking, potato digging experience and baking of potatoes event organized by the women. The food was delicious (May, 2013). |
| **PF25: Objective:** forest conservation | • Maintenance of hardwood forests and red pine forests<br>• Maintenance of walking path<br>• Forest environmental learning | Employees and their families are having fun doing maintenance work while seeking guidance from the stakeholders including the use of instruments and how to proceed safe work. Children participated more than anything else and enjoy the satoyama nature and regard it as a business that also contributes to nurturing the next generation.<br><br>Cassix planted cherry blossoms in commemoration of the 60th anniversary of its foundation. My grandfather planted over thousand trees and I hope to contribute similarly to make this place a cherry blossoming spot. Adults and children refresh in nature in Satoyama. I had a good time (Oct, 2014)<br><br>In this activity, we cut down the green bamboo, and made a handmade gift using bamboo for children. Besides, during the farm crop harvest and preparation of the dinner party, the children enjoyed crayfish fishing and woodworking experience. In the second part, we fully enjoyed the fresh autumn and the food - potato, tempura, burnt vegetables, freshly made rice balls and black soybeans – was enjoyable. The meal with everyone smiling in the nature was really tasty (Oct 2015). |
| **PF26: Objective:** Forest and farmland conservation | • To raise volunteer awareness<br>• Clearing of undergrowth of broad-leaved trees such as oak trees<br>• Utilization of logged trees | Participants had a feeling of joy and a sense of accomplishment of being involved in the management and protection of the oak tree planted by seniors on their mountains, and it was a meaningful activity (May, 2012).<br><br>Three and half-years have passed since we planted the oak trees. When we planted the trees, it was about 1 cm in |

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| | • Planting trees in the mountains and planting potatoes" in the farmland,<br>• Waterway cleaning activities | thickness, but now it is grown to about 7 cm with a thick oak tree (October, 2016).<br><br>As most of the participants were using long-length bears for the first time, I was worried that about 1 hectare of undergrowth can be done, but we were able to complete the work with the cooperation of local people (Kitakubo Ward). |
| **PF27: Objective:** Forest Parkland conservation | • Maintenance of neglected bamboo forest<br>• Processing of harvested bamboo<br>• Maintenance of hardwood forests and artificial forests<br>• Maintenance of forest trails<br>• Environmental learning<br>• logging and sealing treatment of Nara dead tree<br>• hive box hanging and nest box observation<br>• building and maintaining of forest road | In 2007, we planted about 4,000 seedlings with local elementary school students and neighbors, 51 kind of foxtail. We will continue to train volunteers in forests maintenance activities such as undergrowth cutting.<br><br>The Bank is using thinned wood as part of store facilities such as booking table as a way to support the utilization of local timber.<br><br>On Saturday, November 26, 2016 about 60 people including elementary school students, their parents, who applied for public recruitment participated in a "nest box in the forest of Kei Ginki Fureai". This is the fifth time this year. The children learned how to mage and hang a nest box that makes it easy for birds to enter. Children raised voice such as "I want birds to use nest boxes soon! In spring this year, we plan to hold a "nest box observation society" to observe how this hive's nest box is used (Jan, 2017).<br><br>October 2007, in the Bank's Arashiyama training site, about 900 seedlings were planted by JBIC employees, local elementary school students, and about 800 people in the vicinity. Currently, we continue to train employees in forest work. |
| **PF28: Objective:** Conservation of forest mountain village | • Thinning and clearing of undergrowth of artificial forests<br>• Utilization of thinned trees<br>• Tree planting and management of hardwoods etc.<br>• Maintenance of broadleaf forest | On November 17, 2012, we implemented the forest making activities for the first time after the "Agreement on Conservation of Forest Use" was concluded. Fifty employees experienced thinning work during this rainy season. To utilize the thinned trees, we made three benches by cutting off the bark by peeling off branches. The bench will be set up on the hiking trail of Gansan Mountain and will be used by visitors. After the work was finished, we borrowed a local community hall, and all the participants were provided with a boxed lunch with plenty of local ingredients. |

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| | • Maintenance of intruding bamboo forest<br>• effective utilization of bamboo materials<br>• Sidewalk maintenance<br>• Forest and environmental learning such as tree research and wild bird observation | In this activity, the president of the local firewood southern mountain preservation society, Mr. Kato explained about the history of Gansan Mountain and the transition of the four seasons.<br><br>*We made timber stoppers to prevent sediment inflow of climbing roads by using timber which was thinned and dried at the last activity. Although thinning and undergrowth had been the main activity so far, we were able to experience the improvement of the mountain path this time, using the technique and methodology taught by the local people.*<br><br>In addition, we planned hiking for the first time because "I want the families of employees to know the charm of Nanba Mountain naturally rich and our social contribution activities". We picked up acorns and nuts, gazed at the view from Kyoto from the observation deck, enjoyed the legendary picture-communicated with the local community, and also made acorn straps. |
| **PF29: Objective:** Forest conservation | • Planting of maples and blossoms<br>• Nature observation<br>• Woodworking classroom | After the unveiling ceremony of the guide board, we gathered cherry blossoms as "Forest Creation Activities" in the morning and experienced activities of various forests such as nature observation society as "Forest Experience Activity" from the afternoon.<br><br>*We made demonstrations of making Baumkuchen, firewood festival, rocket stove making. Creating Baumkuchen is extremely popular with children. I enjoyed the refreshing feeling when I managed to cut down the tree. Together with the demonstration of rocket stoves making use of renewable energy firewood, it was a day to make use of the forest and make the planet healthy.* |
| **PF30: Objective**: Forest product utilization | • Mowing by machine<br>• Hand hunting<br>• Collection and processing of thinned forests<br>• Production of Kanpoji temple stepping stairs (Mikake hinoki material) | *When I think that it is getting closer to "forest park" which everyone expects little by little, I can see the forest with different eyes again. Sakura is near full bloom. Every time the grass is cut at the vicinity of the waterfall and stream, eating your lunch box with children, you feel some spiritual connection with nature and it will make you feel good (Nov. 2016).* |

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| **PF31: Objective:** Conservation of agriculture and forest lands | • prevention of floods of on agricultural land<br>• provision of green space<br>• utilize abandoned cultivation land<br>• campaign to cooperate with locals to use agricultural land. | *Miyama Town, the place of activity, belonged to Kitakuwata County in the past, and mulberry cultivation was flourishing but all this changed. We plan to restore this by undertaking forest activities, plant broad-leaved trees, conserve and maintain satoyama.*<br><br>*We harvest mulberry and process into mulberry silkworm food, mulberry jam processing* |
| **PF32: Objective**: Protection of watersheds/sanctuaries | • maintenance of bamboo forests<br>• maintenance of artificial forests<br>• forestry maintenance activities that protect water forests/source of three factories in the Kyoto area. | |
| **PF33: Objective**: Forest and bamboo conservation | • Maintenance of artificial forests and broad-leaved forests<br>• maintenance of neglected bamboo forests<br>Forest<br>• Environmental learning etc. | |
| **PF34: Objective**: Field Skills in Environmental Learning | • Maintenance of neglected bamboo groves and hardwood forests<br>• Forest and environmental learning etc. | |
| **PF35: Objective**: Forest conservation | • Maintenance of hardwood forests<br>• Maintenance of walking paths<br>• Thinning and pruning of artificial forest | |

Table G.2: Summary of the audit report on public summaries of the EOMF group forest certification

Note: CAR = Corrective Action Request; NC= Non-conformance

| **Reported outcomes** | **Representative Examples** |
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| Impact on forest management and forest health | In 2007, auditors requested the removal of poor-quality stems that inhibit the growth of better-quality stems. In 2009, auditors reported that EOMF had developed practices and procedures to ensure that thinning activities focus on the removal of poorer quality stems that are inhibiting the growth of better-quality stems.<br><br>In 2008, auditors found during site inspections, that a hawk's nest had not been give adequate protection. Following this, the EOMF developed training to forest managers on how to protect HCV. Moreover, the EOMF modified its procedure for assessing HCVs to include specific direction for forest managers, and the development of an "Example HCV List" of likely values that are candidates for HCV status. The new procedure also allowed external review on the identification of an HCV requiring EOMF to confirm an HCV with an independent expert, such as an OMNR biologist or OMNR archaeologist or another expert as appropriate (2008).<br><br>EOMF should review the use of chemicals in their procedures for addressing Fomes annosus (Red Pine root rot) (2008). 2010 NC- Related to training, supervision was also found to be inadequate specific to avoiding potential damage to the environment. Once damage was realized, proper steps were not taken fast enough to avoid damage of a larger magnitude.<br><br>2012- CAR- The SOP outlines that all private landowner members (i.e. private SLIMF subset) who have active operations (i.e. harvests) will be audited on a yearly basis. In addition, each community/county forest subset (i.e. each forest manager) will be audited at least once per year by the Program Coordinator. As the sampling requirements are written in the Group Standard, the Group Entity is required to stratify by SLIMF (<1000ha) and non-SLIMF (>1000ha).<br><br>In 2011, the audit team raised concerns about the management of SAR. In 2014, the EOMF implemented corrective action ensuring that if a SAR is identified on a private or community woodlot, measures are incorporated into the Forest Management Plan (FMP) and the prescription to address and protect the SAR. For sites visited during this audit, FMPs included specifications for protection and regeneration of butternut, milksnake, monarch butterfly habitat, hickory, white oak and hemlock. The EOMF demonstrated that forest manager and tree markers have a process whereby all Acceptable Growing Stock of tree species that represent less than 10% of the stand shall NOT be harvested to encourage the abundance and regeneration of rare or uncommon tree species in the forest region. |

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| Internal and external capacity development | As a pre-condition for certification, in 2004, EOMF was requested to implement harvest operations within the Lanark Forest Owners Group (LFOG) to provide a track record for assessment of their system of forest planning and management. This pre-condition was met in 2005.<br><br>In 2006, 2008 and 2011, auditors reported that because the EOMF is expanding and now includes forest groups that have their own manager with expansion to places like the city of Oakville. The auditors raised the concern that it was unlikely that the EOMF's certification staff will be able to continue to have as much direct contact with individual operations and its ability to track and maintain accurate and up-to-date records covering the FSC requirements for all certified group members. Following the EOMF implemented several measures to address this:<br>• In 2008, the EOMF developed a system of reporting and an organizational chart that shows the relationships between the different entities of the program, the roles and Responsibilities of each group and appropriate infrastructure to adequately oversee and monitor their properties, including the larger properties.<br>• In 2009, the audit team reported that the EOMF developed a GIS spatial database, including a map showing private properties identified as a point and community forests as a polygon. The EOMF also EOMF updated its system for scheduling internal audits reviews, field visits using computerized system to enhance efficiency.<br>• In 2011 - the EOFG started developing a new Certification Web Data Management application that allow all group members to easily access information covering the entire scope of EOFG services, including information pertaining to the group FSC certificate, as well as a secure system for accessing individual group member information. Group members will be able to upload data and download information necessary to meet their certification requirements. This management tool will greatly assist the Group Manager in membership tracking and in maintaining a central, up-to-date database.<br>• In 2014, the audit team observed that the EOMFs online data management tools was adopted o help the forest managers in the group, particularly from Southern Ontario, to maintain accurate and current information on SAR and avoid any issues of non-conformance through periodical update of all changes in procedures and requirements.<br>In 2011, auditors reported that FME sells standing timber to logging contractors who are not covered in the scope of the certificate. However, the contractors use FME bills of lading which include the FME's FSC certificate code and FSC claim, thus leading to the abuse of the certificate. In 2012, EOFG developed a list of Logging Contractors that operate on EOFG FSC-certified properties. Moreover, all operators who harvest and deliver wood carry numbered bill of lading documentation that identifies the EOFG Certificate number, the forest owner, location, species, destination and product group. |

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| | In 2012, the audit team reported that the Eastern Ontario Forest Group FM/CoC certificate continues to grow with the addition of 8 private landowners, 2 community forests (Grey County and Northumberland County) in southwestern Ontario and a new maple syrup operation. Since the community forests were beyond the group's 'core area' (beyond the 5 Counties of eastern Ontario), this represented a new challenge for the EOFG, as the geographic distance will play a factor in the Group Manager's ability to engage with and monitor conformance of these new members. The audit observed that the development of the online Forest Certification Program Management Tool could help resolve these challenges.<br><br>In 2012, the audit team praised the Certification Working Group (CWG) for providing direction, expertise or links to experts to ensure continued compliance to the FSC standard requirements, particularly the preparation of the silvicultural practices.<br><br>In 2012, auditors reported that new managers were not "vetting" their prescriptions for Endangered and Threatened Species, or other HCVs, with the Coordinator, and the Certification Working Group. Moreover, the auditors found that some landowners were not aware of FSC's policy on pesticide use (i.e. allowable chemicals, pesticide derogations, process for documenting pesticide use) as it had not been discussed by the group manager. The auditors also found several examples where the application of pesticides by Forest Managers (i.e. quantities applied, areas of application, rationale for use) were either not documented, or where records were not provided to the auditors due to the lack of a consistent strategy requiring the documentation of pesticide use and the rationale for use. In 2013, the EOMF developed and provided training on clear procedure and record keeping for use of all pesticides used. The EOFG requires all Forest Managers to enter volume of pesticide applied each year and to ensure that they are not a banned substance. |
| Impact on broader forest management policies and procedures | In 2008, amended its PPM to provide updated information on the status of the protected areas network in eastern Ontario (gap analysis), for the purposes of advising property owners that may be interested in coordinating their property goals with higher level land use planning; and determine if any public forests currently contain any regulated land uses that may be contributing to the network.<br><br>In 2008, the audit team reported that HCVF has been a difficult concept to grasp and implement for resource managers because it is an abstract concept that requires professional biologists, archaeologists, and other experts to fully understand. Thus, the EOMF was required to develop a systemic approach to HCVFs that will work through their template and Policy & Procedures manual. in 2009, the provided a Draft HCVF list prepared with input from the OMNR Kemptville District ecologist, the Westwind, Silvicon, WWF Nature Conservancy and discussion with members of Certification Working Group. The list includes information from the new Endangered Species Act, rare |

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| | forest ecosystems and Significant Woodlands mapping (old growth and rare forest eco sites).<br><br>In 2014, the audit reported that the data management tool provides a coarse filter by creating a live link to the MNR SAR database and mapping that is updated as soon as new information becomes available. The mapping function allows for SAR listings that are property specific based on occurrences and potential habitat of SAR in the local area. Through this tool, each forest manager has a coordinated source for current SAR listings and a direct connection to appropriate management strategies and guidance.<br><br>In 2011, the EOFG submitted evidence which details the strategies for compiling information regarding SAR identification, including a list of 12 groups (other than the OMNR) who are consulted with to determine the overall designation of species at risk for EOFG members. These other groups have contributed to the addition of several other SAR (apart from the NHIC list) that had been provided protection. |
| Stakeholder concerns e.g. aboriginal issues | In 2004, auditors reported that Mohawks Council of Akwesasne were positive about involvement with EOMF in the certification program. similarly, a 2006 audit report also noted that the EOMF does an outstanding job of involving stakeholders in the development and implementation of its operations.<br><br>In 2014, the audit reported that an MNR Resource Liaison Specialist on aboriginal interests has joined the Certification Working Group to provide ongoing information on the context of aboriginal interests. Also, contact information for other regional MNR Resource Liaison Specialists has been provided to all forest managers as a primary source of information on aboriginal interests in their local area;<br><br>Similar concerns were raised in 2013 and 2014 by The Métis Nation of Ontario stating that they have had no contact with EOFG or its members. The following audit report stated that the EOFG has long-established channels for maintaining awareness of aboriginal communities with traditional rights within the regions of their certified operations. These efforts have consisted of: Member of the Mohawk Akwesasne First Nation with a permanent seat on the EOFG board; Several First Nations landowners in the EOCFO program; Member of the Algonquin First Nation is a Forest Technician with South Nation Conservation, and a member of the EOFG Forest Certification Working Group. Further to this, the EOMF stated that an MNR Resource Liaison Specialist on aboriginal interests has joined the Certification Working Group to provide ongoing information on the context of aboriginal interests. Also, contact information for other regional MNR Resource Liaison Specialists has been provided to all forest managers as a primary source of information on aboriginal interests in their local area; Ongoing participation of an aboriginal interest's representative on the Certification Working Group |

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| | In 2006, auditors reported that forest managers and landowners expressed concern of the methods used to map and tract values that may be impacted by human disturbance should their location become known by the public e.g. eagle's nests, wood turtle habitat. Following this, the amended its Standards Operating Procedure to explain how sensitive values will be protected from the public, will be protected. Again, the procedure stated that private forest values mapped will be kept confidential by forest manager while the community forest manager will determine the appropriate method to ensure that sensitive values are not compromised. |
| Training and information | In 2004, the EOMF provided training session on cultural values for management and operational staff involved in forest operations.<br><br>HCVF has been a difficult concept to implement for resource managers to grasp because it is an abstract concept that requires professional biologists, archaeologists, and other experts to fully understand.<br><br>In 2011, the audit reported that EOMF has continued their focus on community outreach and education by co-sponsoring three workshops focused on the traditional forest values of eastern Ontario's First Nations. The workshops were well-attended by group members, forest managers, First Nation community members and the public.<br><br>In 2013, the audit reported that the new data management system that exists online enables the EOMF to communicate to its diffuse partners. The new data management system enables all managers to list their species at risk, HCVs and other critical and risk prone FSC requirements (such as pesticide use; or Chain of Custody reporting) on the website which is then verified by a forest manager or reviewed or approved by the Certification Working Group if it does not fall within the conventional practices.<br><br>In 2009, the audit reported that the EOMF helps to keep landowners updated on new regulations on operations and planning through the purchase of a subscription Legal Tracking Service (Birchwood Environmental Management Inc.). Through the subscription, EOFG receives monthly new information on forest policy, legislation and regulations and forest management. EOFG reviews all content and distributes relevant information to forest managers and participants of the various groups. It was also noted that other documents like 'A Landowner's Guide to Careful Logging' cite provincial laws and regulations that are pertinent for private forestland. This is distributed to the private landowners of the group. |
| Collaboration with external agencies | In 2014, the audit report indicated that the EOMF collaborates with the MNR on whether the of girding for silviculture is allowed in Ontario. Similarly, in 2011, the audit reported that the rutting standards have been changed and are consistent with the Ontario Ministry of Natural Resource. |

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| | In 2009, the audit reported that there is no up to date non-government initiative on protected areas (WWF Canada) which relates to the status of protected areas to advise members on how to contribute. In addition, EOFG worked with GIS MNR staff that had been working on the MNR "Significant Woodlands" exercise to overlay the certified properties onto the significant woodlands. This is a very basic contribution to developing a bigger picture view of protected area status.<br><br>In 2009 the audit reported that the EOMF has corrected that CRA relating to the need to modify procedures for assessing HCVs to include specific direction for forest managers, and the development of an HCV Lis. The EOMF provided an HCVF list prepared with input from the OMNR Kemptville District ecologist, based on other information from Westwind, Silvicon, WWF Nature Conservancy – FSC. The list was reviewed by forest managers in the Certification Working Group. The list includes information from the new Endangered Species Act, rare forest ecosystems and Significant Woodlands mapping (old growth and rare forest eco sites). |
| Forest worker health and safety issues | In 2012 the audit reported that health and safety issues are not consistently reviewed with operations staff in the field just prior to commencement of harvest operations. However, in 2013 the audit team reported that the EOMF has addressed this challenge by modifying its policies and procedures to require members to review health and safety requirements with the on-site forest worker. |
| Communication and Information dissemination | During this annual audit evidence on the identification of HCVs areas demonstrated consultation efforts that were primarily focused on meetings of the Certification Working Group (CWG). While the available knowledge on the CWG is significant and includes qualified specialists and aboriginals, it does not provide for effective consultation with directly affected persons on the identification of high conservation values and the management thereof.<br><br>In 2012, the audit observed that EOMF has continued their focus on community outreach and education by co-sponsoring three workshops focused on the traditional forest values of eastern Ontario's First Nations. The workshops were well-attended by group members, forest managers, First Nation community members and the public. |
| Impact of mill closure | In 2015 the audit reported that while pulplogs appeared merchantable, the nearest market for these logs (Espanola) rendered the transport of this material unmarketable. Additionally, the harvest contractors are paid a lump sum upon winning the bid to harvest, which encourages contractors to utilize as much of the wood as possible during operations. In this way, the marketability of the remaining pulplogs is not considered to be of concern. |

APPENDIX H: Research Certificate and Instruments

Introductions

**Introduction**
**John Boakye-Danquah**

My name is John Boakye-Danquah, and I am a Ph.D. candidate at the School of Environment and Sustainability (SENS) at the University of Saskatchewan. I am currently conducting research on the role and experiences of Model Forests in sustainable forest management. This research is funded by the Social Sciences and Humanities Research Council of Canada.

As part of this research, I will be visiting Eastern Ontario to learn more about sustainable forest management initiatives. Specifically, I am interested in knowing how collaboration between the Model Forest, woodlot owners, forest operators/managers, maple producers, and forestry associations, under the EOMF Group Forest Certification scheme support sustainable forest management. I have conducted a similar study in Kyoto, Japan where I examined how the Kyoto Model Forest Association, small-scale foresters, community volunteer groups, private corporations and city/municipal governments collaborate to support sustainable forest management initiatives. My research focuses on lessons that can be learned from forest management initiatives in both Eastern Ontario (Canada) and Kyoto (Japan), mainly to support small-scale forestry.

I intend to visit Eastern Ontario between July – August 2016, and I will call on you and your organization during my trip. My visit to Eastern Ontario has been made possible through the support of Scott Davis, the Manager of the EOMF Forest Certification scheme. I am eager to learn how and why you or your organization got involved in the EOMF Forest Certification scheme, and the role played by the Model Forest. I would like to know about how the EOMF Forest Certification scheme has influenced your forest management activities, and your successes and challenges.

If you have any questions or concerns with regards to this study, you may contact me (my contact details are below) or Scott Davis, the Manager of the EOMF Forest Certification program. I look forward to talking to you in the near future.

Kind regards,

John Boakye-Danquah,

Doctoral Candidate, SENS, University of Saskatchewan

Email: jmb357@mail.usask.ca

**Project Title:** The Contributions of Model Forest Organizations towards Governance for Sustainable Forest Management of Small-scale Private Forests: Lessons from Eastern Ontario and Kyoto Model Forests.

**Researcher:** John Boakye-Danquah, PhD candidate, School of Environment and Sustainability (SENS), University of Saskatchewan, 308 Kirk Hall, 117 Science Place, Saskatoon, SK, S7N 5C8, Tel (306) 881-3307, e-mail: jmb357@mail.usask.ca

**Supervisor:** Maureen Reed, Professor and Assistant Director Academic, School of Environment & Sustainability, University of Saskatchewan, 328 Kirk Hall, 117 Science Place, Saskatoon, SK, S7N 5C8, Tel (306) 966-5630, e-mail: maureen.reed@usask.ca Fax (306) 966-2298.

**Purpose(s) and Objective(s) of the Research:**

The purpose of this research is to assess the effectiveness of intermediary organizations in convening private-social partnerships to support sustainable forest management of small-scale forest operators through market-based incentives. To this end, the research will, therefore, seek to examine the experiences and contributions of intermediary organizations - Model Forests - (MFs) (i.e. Kyoto Model Forest (KMF) in Japan, and Eastern Ontario Model Forest (EOMF)) in Canada, to advance SFM goals among small-scale forest owners. The research objectives are:

1) Develop an evaluative framework on the effectiveness of Market Based Incentives used by Model Forest organizations to achieve sustainable forest management that draws attention to equity, and empowerment outcomes;

2) Apply the framework to assess Model Forests as intermediary organizations to support sustainable forest management of small-scale forest operators;

3) Investigate the procedural and substantive outcomes of Market Based Incentives in sustainable forest management from the perspectives of small-scale forest operators; and

4) Consider the implications of private-social partnerships in multi-level forest governance arrangements for the governance of sustainable forest management.

**Procedures:**

This interview is to be conducted in person. In person interviews will take place in a location and at a time chosen by the interviewee. Interview should take approximately 30-50 minutes to complete. Interviews will be audio recorded and transcribed, if permitted by the interviewee.

Please feel free to ask any questions at any time regarding the procedures and goals of the study or your role in this interview.

**Funded by:**

This research is being funded by an Insight Grant of the Social Sciences and Humanities Research Council (SSHRC) of Canada.

**Potential Risks:**

There are no known or anticipated risks to you by participating in this research.

**Potential Benefits:**

This research has the potential to provide useful lessons for all research participants, i.e., foresters, the Model Forests and other stakeholders directly involved in local forest management initiatives in both Canada and Japan. Your participation in this research is an opportunity for you to share your knowledge and experiences in sustainable forest management initiatives to enhance the collaboration and participation by all relevant stakeholders in forest management. The comparison of cases across countries is expected to facilitate innovative knowledge sharing between actors including foresters, Model Forest organizations as well as knowledge exchange between 'scientists' and local people in sustainable forest management.

**Compensation:**

Participants will not be compensated financially for this interview.

**Confidentiality:**

Confidentiality of participant information will be maintained throughout the research process. Consent forms and identifying information will be accessible only to the principal investigator and the researcher. Participants information will be stored separately from the data so participants will not be identified based on their response. On the other hand, because participants for this research have been selected from a small group of people, many of whom are known to each other, it may be possible for other participants to identify you by association. In this instance, please respect the confidentiality of the other members of the group by not disclosing the contents of this discussion outside the group and be aware that others may not respect your confidentiality. Although information collected from this research will be used in published journals and presented at conferences, your identity will remain confidential as much as possible. Where there is the need to use direct quotations in reporting the results, participants will be given a pseudonym and all identifying information will be removed from the report.

There are several options for you to consider if you decide to take part in this interview. You can choose all, some or none of them. Please put a check mark on the corresponding line(s):"

I grant permission to be audio taped: Yes: ___ No: ___

I grant permission to have my organization's name used: Yes: ___ No: ___

I wish to remain anonymous: Yes: ___ No: ___

I wish to remain anonymous, but you may refer to me by a pseudonym: Yes: ___ No: ___

The pseudonym I choose for myself is: _____

You may quote me and use my name: Yes: ___ No: ___

**Storage of Data:**

Interview transcriptions and audio recordings will be stored in password protected computer files. Data will be stored for a minimum of 5 years under the care of Principal Investigator **Dr. Maureen Reed**. When the data is no longer required, the data will be deleted or destroyed.

**Right to Withdraw:**

Your participation is voluntary and you can answer only those questions that you are comfortable with. You may choose to withdraw from the research for any reason, at any time without explanation or penalty of any sort. Should you wish to withdraw, at your request, your identifying information and data collected from you will be destroyed and not included in the study. Your right to withdraw data from the study will apply until December 2017. After this date, it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

**Follow up:**

To obtain results from the study, a summary of the results will be presented to the Model Forests in both Japan and Canada. Participants can also obtain a copy of the results directly by contacting the researcher at jmb357@mai.usask.ca.

**Questions or Concerns:**

If you have questions concerning the research project, or would like a copy of the research results, please feel free to ask at any point; you are free to contact the researchers at the numbers provided if you have any other questions. The University of Saskatchewan Research Ethics Board has approved this research project on ethical grounds on ….. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office ethics.office@usask.ca (306) 966-2975. Out of town participants may call toll free (888) 966-2975.

**Consent**

**Signed Consent**

Your signature below indicates that you have read and understand the description provided; I have had an opportunity to ask questions and my/our questions have been answered. I consent to participate in the research project. A copy of this Consent Form has been given to me for my records.

| _____ | _____ | _____ |
|---|---|---|
| *Name of Participant* | *Signature* | *Date* |

_____ _____

*Researcher's Signature* *Date*

***A copy of this consent will be left with you, and a copy will be taken by the researcher.***

**Oral Consent**

If consent is obtained orally, this will be audio-recorded. The Consent Form will be dated, and signed by the researcher(s), as below, to indicate that "I read and explained this Consent Form to the participant before receiving the participant's consent, and the participant had knowledge of its contents and appeared to understand it."

| *Name of Participant* | *Researcher's Signature* | *Date* |
|---|---|---|

**Visual Data Consent**

Your signature below indicates that you have read and understand the description provided; I have had an opportunity to ask questions and my/our questions have been answered. I consent to participate in the research project with myself and or my property photographed. A copy of this Consent Form has been given to me for my records.

- Photos may be taken of me [my property] for: Analysis _____ Dissemination* _____
- Videos may be taken of me [my property] for: Analysis _____ Dissemination* _____

*Even if no names are used, you [or your property] may be recognizable if visual images are shown as part of the results.

**Introduction and motivation**

1. What do you think are the key issues related to small-scale forestry in this region?

2. Can you describe the nature of the forest management agreement with the EOMF?

3. Motivation – Reasons for participation in the certification scheme
    a. Why did you decide to certify your forest?
    b. How did you get information about certification before participating?
    c. Did the MF play any role?
    d. Did the FOA play any role?
4. Has your involvement in the certification scheme changed the way forest is managed?
    a. Forest planning, disease control, harvesting, re-planting
    b. Has certification altered management practices or not?
    c. What is your perception about a third party examining your management practices?
5. Since joining the certification scheme what is the most important thing that you have learned?

**Group membership and interactions**

6. Were you given sufficient explanation as to what your membership entails?
7. What do you consider to be your most important role and responsibility as a member of the forest certification group?
8. It is stated in the FSC standard for group certification that as long as members comply with all the requirements of group membership, their forest properties are covered by the forest management certificate.
    - Does this affect the way you manage the forest compared with previously?
    - Has certification impacted your relationship with other forest owners? Please explain?
    - Does certification provide opportunities to interact with other land owners?
    - Has certification changed your relationship with neighbouring land owners? Please explain
    - Have you had concerns about how other group members manage their lands?
    - Are you worried about how non-compliance of other group members might affect you?

**Management plan**

- Did you have a forest management plan before you engaged in the certification process?
- How important is having a forest management plan now?
- How does having a forest management plan changed the you your forest is managed?
- Do you have any concerns about how the management plan was prepared?
- Did you play any role in the preparation of the management plan?

**Relationship with the EOMF**

- How do you communicate with the EMOF?
- How often does the EOMF communicate with you?
- What often triggers your communication with the EOMF?
- Have you benefited any form of training from the EOFM?
- Are you satisfied with how the association is represented on the forest management program?
- Are you satisfied with the decision-making processes used by the KMFA?
- Do you trust the EOMF in the management of the forest certification program?

**Impacts of certification**

1. What does sustainable forest management (SFM) mean to you?
2. Has the certification program contributed to the achievement of SFM?
3. How has certification affected the following aspects of forestry?

| | |
|---|---|
| 2 Tenure and use rights and responsibilities | • Has the certification affected forest tenure in any way?<br>• Has certification affected your rights to use the forest in any way?<br>• Has certification affected your responsibilities towards forest management in any way? |
| 5 – Benefits from the forest, | • What is the most important benefits that this region has derived from the certification process?<br>• What is the most important benefit that you have derived since joining the certification?<br>• Have you had access to certified wood markets?<br>• Have you had better prices for your log because of the certification? |
| 6 – environmental impact, | • What do you think is the most important environmental benefits of the certification? |
| 9 maintenance of high conservation values | • What is the most important benefit that certification has had for the protection of high conservation forest values? |

**Challenges**

4. What do you consider to be the most significant challenge for landowners involved in the certification scheme?
5. Are you concerned about issues of?
    a. Cost of certification
    b. Market benefits
6. In what areas of the certification process do you think has been the least successful

**Future prospects**

7. How do you see the prospects of certification in the future?
8. Is there anything that I did not say that you want to add to what we have discussed?

**Introduction**

1. Can you describe the processes leading to the award of the group certificate? Did the EOMF initiate it or who requested it?
2. How important was the FSC regional standards that was developed earlier to the implementation of the group certification scheme?
3. Who were the stakeholders (ref to page 1 of manual)?
    a. Highlight role of government
    b. Private foundations
    c. Forestry associations
4. What factors went into deciding who becomes a member of the working group?
5. What are some of the most important decisions that have been taken by the working group and why?

**Day to day administration of the certificate**

6. Can you describe the administrative processes involved in managing the certificate?
7. Since the group membership has been growing, do you have the necessary human and technical resource to keep up with the management of the scheme?
8. Reading through the standards and certification and policies and procedures manual, there is a lot of emphasis on training and communication. What are some of the most important training that you have provided and why?
9. How do you communicate with stakeholders?
10. How do you explain the certification process to the participants including the roles and obligation of members?

**Management plan**

11. Do you have any idea whether forest owners here had a management plan before the coming of certification?
12. How important is it for land owners to have a management plan?
13. Are land owners involved in the preparation of the management plan?
14. Does having a management plan change the way the forest is managed in any fundamental way?
15. Did the management plan factor in your own long held knowledge about your land?
16. How involved were you in the process of developing the management plan?

**Financial sustainability**

17. In the manual, one pf the responsibilities of the group manager is to strive for financial sustainability? /full cost recovery? How do you intend to achieve this? Have you been able to achieve this?
18. You also talked about balance equity representation? What does this mean?
19. Has your financing plan changed since the start of the program till now? (% of annual fees to total??)
20. What is your financing plan? How are you working towards?

**Communication**

21. What are some of the ways that you communicate with your stakeholders?
    Meetings [ ]; Emails [ ]; Telephone [ ]; Brochures [ ]
    Forestry consultants [ ]; others [ ]
22. How often do you communicate with your stakeholders?
    - Monthly [ ]; Quarterly [ ]; Yearly [ ]
23. What triggers that communication? (Is it by activity, or is it regular meetings, emails, etc.)
24. Can you mention examples of specific strategies that you employ to share information and report to the local community?
25. Which information sharing/reporting actions have been;
    - The most successful and why?
    - The least successful and why?
26. Which community sectors have you engaged in targeted outreach and consultation activities….aboriginal groups, students, etc.
27. The number of formal agreements with community organizations and user groups.

**Impacts of certification**

28. What does sustainable forest management (SFM) mean to you?
29. Has the certification program contributed to the achievement of SFM?
30. How has certification affected the following aspects of forestry?

| | |
|---|---|
| 2 Tenure and use rights and responsibilities | • Has the certification affected forest tenure in any way?<br>• Has certification affected your rights to use the forest in any way?<br>• Has certification affected your responsibilities towards forest management in any way? |
| 5 – Benefits from the forest, | • What are the most important benefits that this region has derived from the certification process?<br>• What is the most important benefit that you have derived since joining the certification?<br>• Have you had access to certified wood markets?<br>• Have you had better prices for your log because of the certification? |
| 6 – environmental impact, | • What do you think is the most important environmental benefits of the certification? |
| 9 maintenance of high conservation values | • What is the most important benefit that certification has had for the protection of high conservation forest values? |

**Challenges**

31. What do you consider to be the most significant challenge for landowners involved in the certification scheme?
32. Are you concerned about issues of?
    c. Cost of certification
    d. Market benefits
33. In what areas of the certification process do you think has been the least successful

**Future prospects**

34. How do you see the prospects of certification in the future?
35. Is there anything that I did not say that you want to add to what we have discussed?

Guide for Private company/Citizens/Volunteers in the KMFA

**A: Introduction**

1. What is the goal of private company/Citizens/Volunteers' group in relation to forest work?
2. Which group/organization are you in partnership with in forest management?
3. How did your group get to partner with the group/organization?
4. Can you describe the nature of the forest management program you are involved in with the group/organization?

**B: Relationship with the KMFA**

5. What is the nature of your relationship with the KMFA?
6. What kinds of information does the KMFA share with you?
7. What are some of the benefits that your group has derived from being a member of KMFA?
8. In what ways do you want the KMFA to support your group?

**C: Relationship with the Company**

9. What kinds of activities do you undertake with the group/organization?
10. What is the most important activity you have undertaken with the company since both organizations started working together? Why is it important to you?
11. What are some of the benefits that your group has derived as a result of your partnership with the group/organization?
12. What are some of the benefits that your community has derived from your partnership with the group/organization?
13. What are some of the challenges working with the group/organization? Please, explain your answer
14. What are some of the challenges that your group/organization faces? Please, explain your answer.

**D: Contributions of current forest management program to sustainable forest management**

15. What does sustainable forest management (SFM) mean to you?
16. Do you think your forest management activities with the company contribute to sustainable forest management? Please, explain

**E: Other information:**

| **Background information** | **Answer** |
|---|---|
| Name of group | |
| Location of the group | |
| Number of members (male and female) | |
| Number of times group meet in a year | |
| Year of formation | |
| Sources of funding for group activities | |

**The role of Model forest groups in the governance of small-scale private forest. A case of the Eastern Ontario Model Forest in Canada and Kyoto Model Forest Association in Japan**

The purpose of my research is to understand the roles that citizens or private companies play in model forest activities to advance sustainable forest management. In Kyoto, I am mainly interested in the activities of several groups or organizations relating to the network of Kyoto Model Forest Association. I'm going to do a similar research in Ontario in Canada. Your answer is precious to this research. There is no right or wrong answer.

The participation in this research is voluntary and you can quit your participation anytime. The data will be reported anonymously, and it will not be open in a way that can identify individuals. I will not use your personal data such as your gender, or your age and I will not release the information to the public.

This research project was approved by the research ethics committee of the University of Saskatchewan. If you have any questions about your rights as a participant, you can contact the Research Ethics Office in the university (ethics.office@usaska.ca).

For further information on this research, please send contact the researcher:

John Boakye-Danquah / University of Saskatchewan

School of Environment and Sustainability, Doctoral course

E-mail: jmb357@mail.usask.ca

By submitting this questionnaire, you will be deemed to agree with informed things above and to understand the above conditions of participation in this research. It takes about 20 minutes to finish answering this questionnaire.

**A. participation to forest management activities**

I ask you how often you have participated in your forest management activities and the reasons why you started to participate in it.

1. From the list below, select which group/organization/category you belong to. Please select as many as you want to.
   a. member of a citizens group
   b. member of a forest volunteer
   c. private corporation
   d. individual forest owners
   e. local government
   f. other (please explain……..

2. How many years have you been involved in forest management activities?

   _____years

3. People participate in forest management for different reasons. Please select the reasons that best describes your reasons for participating in the activities of the KMFA. You can select more than one reason.

| | **Please tick all that apply** |
|---|---|
| I am interested in the effects of forest use on the environment. | |
| I am interested in the protection of non-forestry products（non-forestry products such as mushrooms and bamboo shoots）. | |
| I want to contribute to the realization of sustainable forest management. | |
| I want to contribute to reviving local communities to which I belong to. | |
| I make a living based on forest resources. | |
| I want to learn more about forest management in this region | |
| I want to protect the essential values of forest in Kyoto | |
| I believe it is important to involve everybody in forest management | |
| My occupation can be affected by forest management by public or private organizations | |
| I am interested in conserving the values of forests in Kyoto. | |
| I am a member of the forest owner's association. | |
| I believe in the goals of the MF | |
| I own forests. | |
| Others（Please specify.） | |

4. Regarding your participation in forest management activities, please select from the list below which activities do you participate in and how often.

| | always | sometimes | seldom | never |
|---|---|---|---|---|
| Such improvement as pruning, weeding, removing dead trees | | | | |
| Participation in timber harvest | | | | |
| Participation in conferences and events concerning forest and forestry | | | | |
| Participation in activities which keep and maintain logging roads | | | | |
| Participation in patrol of forests | | | | |
| Participation in forest recreation activities | | | | |

| | | | | |
|---|---|---|---|---|
| Participation in mushroom growing in woods | | | | |
| Participation in studies and surveys concerning forestry | | | | |
| Doing activities which encourage local government to preserve water in forests | | | | |
| Contribution to collect donations for forest management | | | | |
| Supporting exchange of information among stakeholders of forest and forestry | | | | |
| Participation in forest management activities which Kyoto Model Forest Association supports | | | | |

5. Please write whatever you have learnt through your participation in forest management activities. You can write as many as you want to.

| |
|---|
| |

7. Regarding your participation in forest management activities, how often do you face any of the challenges listed below.

| | always | sometimes | never | don't know |
|---|---|---|---|---|
| Low compensation level of forestry workers who do forest management activities in the region as an occupation | | | | |
| Low compensation level of local stakeholders and forestry family who technically support forest volunteer activities | | | | |
| Lack of opportunities to participate in decision making concerning forest management | | | | |
| Lack of effective leadership in adjusting regional foresee planning activities | | | | |

| | | | | |
|---|---|---|---|---|
| Forest owners' association's inactiveness of adjusting opinions among forestry stakeholders | | | | |
| Lack of appropriate information concerning participation in forestry activities | | | | |
| Risk of working conditions when pruning, weeding, removing dead trees | | | | |
| Low level of training for forestry workers who do forest management activities | | | | |
| Low level of training for volunteers who participate in forest management activities | | | | |
| Lack of opportunities when women relating forests participate in forestry activities | | | | |
| Shortage of time because of other activities | | | | |
| Distance to the place where conferences and events are held | | | | |
| Lack of mutual respect and equality in conferences and meetings | | | | |

**B. Relationship with Kyoto Model Forest Association**

I'm asking a relationship between you and Kyoto Model Forest Association.

8. How well do you know the Kyoto Model Forest Association in relation to forest governance in this region? There are 3 options. **(Mark a circle on one option.)**

a. Know well
b. Know to some extent
c. Don't know very well

9. What do you associate with the word of Kyoto Model Forest Association?

Please write down it in a blank below.

10. When did you get to know Kyoto Model Forest Association?

___Years ago

11. Please evaluate the importance of Kyoto Model Forest Association regarding the governance of forests in this region.

a. Very important
b. Important
c. Important to some extent
d. Not important

12. Last year, how many times did you get notices about activities from Kyoto Model Forest Association? Please write down the number.

___Times

13. Last year, how did you get information from Kyoto Model Forest Association? Please choose every option which best reflects your experience with the KMAF.

a. Through participation in conferences or events
b. E-mails
c. Brochures
d. Through a Forestry cooperative
e. Newsletters
f. Through forestry consultants
g. Facebook, twitter, radio, TV and so on
h. Phone call
i. Others (please write down concretely)
j. got no information

14. What is the most impressive thing that you heard from the Kyoto Model Forest Association over the past year? Please write down in a blank below.

15. Please, evaluate your familiarity of the extent of involvement of the Kyoto Model Forest Association in the following forestry related activities

| | Very familiar | Moderately familiar | Not at all familiar |
|---|---|---|---|
| High interest of Kyoto Model Forest Association in local forest management | | | |
| Quality of re by Kyoto Model Forest Association to regional forest owners | | | |

| | | | |
|---|---|---|---|
| Opportunities for women to join decision making on forest management | | | |
| Opportunities for scientists to join decision making on forest management | | | |
| Preventing wild animals from damaging forests | | | |
| Preventing diseases and insects from damaging forests | | | |
| Preventing forest fire | | | |
| Trust between Council and regional forestry workers | | | |
| Opportunities to learn new things about forests | | | |
| Degree for local society to join decision making on forest management | | | |

16. Evaluate your satisfaction on the contribution of the KMFA in the following forestry related activities in this area or region (meaning Kyoto). Please circle one option which is most close to your idea from "completely dissatisfied" to" completely satisfied" in the table below.

| | Completely dissatisfied | Somewhat dissatisfied | No opinion | Somewhat satisfied | Completely satisfied |
|---|---|---|---|---|---|
| Improve participation of local residents in forest management | | | | | |
| Offer trainings and technical guidance on forest management activities | | | | | |
| Offer supports to repair forest damages by wild animals on forests | | | | | |
| Offer supports against damages by diseases and insects on forests | | | | | |
| Coordinate groups and organizations related to forestry and promote getting knowledge on forest management | | | | | |
| Strengthen relationships between forest owners and Prefectural government on forest management | | | | | |
| Strengthen relationships between forest owners and municipalities on forest management | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Strengthen relationships between forest owners and non-forestry private companies on forest management | | | | | |
| Adjust administrative forest and forestry policy (e.g. subsidies and forest certification system) | | | | | |
| Support management of the fund which is needed for forestry management | | | | | |
| Support diversification of products which forests produce (e.g. tourism services and of NTFPs) | | | | | |
| Offer urban volunteers opportunities to participate in forest management activities | | | | | |
| Promote technical development and studies concerning regional forestry | | | | | |
| Expand regional employment which forestry brings | | | | | |
| Others (Please specify) | | | | | |

17. If you have ideas of anything that you want Kyoto Model Forest Association to do or opinions about Kyoto Model Forest Association, please write down them in a blank below. Your opinions will be told Kyoto Model Forest Association.

**C. Personal information**

If you don't mind, please tell me about yourself.

18. Please tell your gender.

a. male b. female

19. Please tell your age.

a. 18-24 years old
b. 25-34 years old
c. 35-44 years old
d. d.45-54 years old
e. 55-64 years old
f. 65 years old or more

20. if you answered for an organization, does your organization own a forest?

a. Yes b. No

*If you answered “No” in question No.20, please move to question No. 24

21. How big is the forest which you or your organization own? There are 6 options.

**(Mark a circle on one option.)**

a. 10 ha or less b. 11-20 ha c. 21-30 ha d. 31-40 ha

e. 41-50 ha f. 50 ha or more

22. How long have you or has your organization owned the forest?

a. 0-5 years b. 6-10 years c. 11-15 years d. 16-20 years

e. 21- 25 years f. 26- 30 years g. 31-35 years h. 36-40 years

i. 40 years or more

23. How is the forest managed? There are 3 options.

a. My organization manages it by itself.

b. My organization entrusts the management to a private company.

c. No. It’s not managed at all.

24. If you have opinions about what we have already mentioned or what we haven’t mentioned, please write down them in a blank below.

**The Contributions of Model Forest Organizations towards Governance for Sustainable Forest Management of Small-scale Private Forests: Lessons from Eastern Ontario and Kyoto Model Forests.**

**Introduction:**

The purpose of this research is to understand the role that Model Forests play in supporting Sustainable Forest Management. You have been selected to participate in this research because of your relationship with the Eastern Ontario Model Forest (EOMF). Your input is valuable to this research. I have conducted similar research in Kyoto, Japan with the Kyoto Model Forest Association.

Participation in this research is voluntary, and you can stop the survey at any time. There are no right or wrong answers. Please, note that the data will be reported anonymously. Any personal data (i.e. gender, age, etc.) will not be used or published in a way that risks your identification.

This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any question regarding your rights as a participant may be addressed to that committee through the Research Ethics Office (Email: ethics.office@usask.ca, Tel: (306) 966-2975). Out of town participants may call toll free (888) 966-2975.

For more information about this study please contact the researcher, John Boakye-Danquah, School of Environment and Sustainability (SENS), University of Saskatchewan (Email: jmb357@mail.usask.ca, Tel: 1 (306) 881-3307) or the Principal Investigator, Dr. Maureen Reed, School of Environment and Sustainability (SENS), University of Saskatchewan (Email: maureen.reed@usask.ca, Tel: 1 (306) 966-5630).

By completing and submitting this questionnaire, YOUR FREE AND INFORMED CONSENT IS IMPLIED and indicates that you understand the above conditions of participation in this study.
This questionnaire is expected to take a maximum of 25 minutes to complete.

**A: MOTIVATIONS AND PERCEPTIONS ON COLLABORATIVE FOREST MANAGEMENT ACTIVITIES**

1. In the table below, please rank up to three of the most important reasons for being involved in forestry related activities. Please provide your answers using 1, 2, and 3 with 1 being the most important motivation, 2 the second important motivation, and 3 the third important motivation.

| | Ranking (1, 2, 3) |
|---|---|

| | |
|---|---|
| a. I am concerned about the impact of forest utilization on the environment. | |
| b. I am worried about the impact of forestry on non-timber forest products. | |
| c. I want to contribute to achieving Sustainable Forest Management. | |
| d. I am concerned about the inclusion of Aboriginal people's values in forest management activities. | |
| e. I want to contribute to my community. | |
| f. I depend on forest resources for my livelihood. | |
| g. I want to learn more about forest management in this region. | |
| h. I want to learn more about nature. | |
| i. I have business interests that may be affected by the outcome of forest management process. | |
| j. I want to protect the intrinsic values of forests. | |
| k. I am a member of a Forest Owners' Association. | |
| l. I own a forest. | |
| m. Other, please specify (……..) | |

2. Please indicate how often you face any of these challenges in your participation in forestry governance.

| | Regularly a challenge | Sometimes a challenge | Never a challenge | Do not know. |
|---|---|---|---|---|
| a. Low level of remuneration for local forest workers. | | | | |
| b. Inadequate opportunities to participate in decision-making on forest management. | | | | |
| c. Lack of effective local leadership to coordinate forest planning activities. | | | | |
| d. Poor coordination of private forest owners by the local Forest Owners' Association. | | | | |
| e. Difficulty in meeting provincial tax regulations on private forest ownership. | | | | |
| f. Lack of adequate information to participate in forestry decisions. | | | | |
| g. Unsafe working conditions for forestry workers. | | | | |
| h. Low level of training for forestry workers involved in forest management activities. | | | | |

| | | | | |
|---|---|---|---|---|
| i. Lack of transparency in forest management contracts involving forestry associations. | | | | |
| j. Inadequate opportunities for women to participate in forestry activities. | | | | |
| k. Inadequate opportunities for Aboriginal peoples to participate in forestry activities. | | | | |
| l. Inadequate opportunities for the participation of First Nation communities in decisions on forest management. | | | | |
| m. Lack of time to participate in decisions regarding forests. | | | | |
| n. Longer distance to forestry meeting places. | | | | |
| o. Lack of mutual respect and equality at forestry meetings. | | | | |
| p. Other, please specify (……) | | | | |

**B. RELATIONSHIP WITH THE EASTERN ONTARIO MODEL FOREST**

3. How familiar are you with the Eastern Ontario Model Forest's involvement in forestry governance in this locality?
   a. [ ] Very familiar b. [ ] Moderately familiar c. [ ] Not at all familiar

4. How important is the Eastern Ontario Model Forest regarding the governance of forests in this region?
   a. [ ] Very important b. [ ] Important c. [ ] Somewhat important
   d. [ ] Not important e. [ ] No idea

5. How does the Eastern Ontario Model Forest communicate with you in forest-related activities? Please select as many responses as appropriate.
   a. [ ] Through participation in conferences or events
   b. [ ] E-mails
   c. [ ] Brochures
   d. [ ] Through a Forestry Association
   e. [ ] Newsletters
   f. [ ] Through forestry consultants
   g. [ ] Social media e.g. Facebook, Twitter,
   h. [ ] Radio/TV.
   i. [ ] Phone call
   j. [ ] Others (please specify)……..

6. Please list the organizations or groups in the EOMF network that you have collaborated with over the last five years and the nature of the collaboration.

| Organization/group I/we have collaborated with | | The nature of collaboration (e.g. education, training, funding support etc.) |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |

7. In the space below, please explain what you have learnt as a result of your association with the Eastern Ontario Model Forest.

8. In the table below, please indicate your level of satisfaction about the involvement of Eastern Ontario Model Forest in the following forestry-related activities. Please select the response that best reflects your opinion.

| | Completely Dissatisfied | Somewhat Dissatisfied | Somewhat satisfied | Completely satisfied | No opinion |
|---|---|---|---|---|---|
| a. Promotes local participation in decisions on forest management. | | | | | |
| b. Provides opportunities for education about Aboriginal peoples. | | | | | |
| c. Provides training and technical support in forest management. | | | | | |
| d. Provides funding to support forest management activities. | | | | | |
| e. Provides support to control forest - disease. | | | | | |
| f. Helps foster collaboration with Aboriginal peoples. | | | | | |
| g. Provides support for wildfire management. | | | | | |
| h. Coordinates government forestry programs. | | | | | |
| i. Enhances relationships between forest owners and other land/property owners. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| j. | Supports the development of forest product processing firms (e.g., sawmills). | | | | | |
| k. | Supports community development including common public goods/infrastructure. | | | | | |
| l. | Supports the development of tourism services related to forestry. | | | | | |
| m. | Supports the commercialization of non-timber forest products. | | | | | |
| n. | Supports collaboration among forest tenure holders. | | | | | |
| o. | Promotes local-level science and research on forestry. | | | | | |
| p. | Other, please specify (……) | | | | | |

9. Have you been involved in the Eastern Ontario Model Forest certification program?
   a. [ ] Yes b. [ ] No
   If no, why not?.....

**If you are involved in the forest certification program as a land owner or forest manager, please click here (MOVE TO SECTION C through to SECTION C).**

**If you are not involved in the certification program, click here (MOVE TO SECTION D)**

## C. PERCEPTIONS ABOUT THE EASTERN ONTARIO MODEL FOREST CERTIFICATION PROGRAM

10. How long have you been involved in the Eastern Ontario Model Forest certification program?
    a. [ ] Less than a 1 year
    b. [ ] 1- 4 years
    c. [ ] 5 - 9 years
    d. [ ] more than 10 years?

11. How did you get to know of the forest certification program?
    a. [ ] Through the Woodlot Owners Association
    b. [ ] From friends and family members
    c. [ ] Through outreach by EOMF
    d. [ ] Through external stakeholder, please specify (……..)

e. [ ] Through a government agency, please specify (……..)

f. [ ] Other, please specify (……..)

12. What are your general impressions of the forest certification program? Please write your response in the space provided below.

13. Have you considered leaving the certification program?

a. [ ] Yes b. [ ] No

If yes, what reason(s) might make you leave the program?

14. Please rate each factor below, indicating how important the factor was in influencing your decision to join the Eastern Ontario Model Forest certification program.

| | Not important | Moderately important | Very important |
|---|---|---|---|
| a. Improve access to information on current forest management practices. | | | |
| b. Enhance record keeping on forests. | | | |
| c. Have access to less costly professional monitoring of forests. | | | |
| d. Share the costs of professional training. | | | |
| e. Respond to the market demand for certified wood products. | | | |
| f. Contribute to the preservation of high conservation forest values. | | | |
| g. Safeguard local employment. | | | |
| h. Receive higher prices from wood markets. | | | |
| i. Meet provincial regulations on woodlot management such as taxation. | | | |
| j. Be recognized for good forest management practices. | | | |
| k. Participate in the woodlot owners' association. | | | |
| l. Involvement of the Model Forest. | | | |
| m. Recommended by a government agency. | | | |
| n. Encouraged by the participation of a fellow forest owner. | | | |
| o. Other, please specify (…….) | | | |

15. In the table below, please rate your level of satisfaction or dissatisfaction with some of the factors that influenced your decision to join the Eastern Ontario Model Forest certification program.

| | Completely dissatisfied | Somewhat dissatisfied | Somewhat satisfied | Completely satisfied | No opinion |
|---|---|---|---|---|---|
| a. Improved access to information on current forest management practices. | | | | | |
| b. Enhanced record keeping on forest management. | | | | | |
| c. Reduced costs related to forest management. | | | | | |
| d. Increased access to less costly professional forest monitoring. | | | | | |
| e. Shared costs of professional training. | | | | | |
| f. Enhanced access to certified wood market. | | | | | |
| g. Improved contribution to the preservation high conservation forest values. | | | | | |
| h. Safeguarding of local employment. | | | | | |
| i. Higher prices from wood markets. | | | | | |
| j. Recognized for good forest management practices. | | | | | |
| k. Other, please specify (…….) | | | | | |

16. Regarding your involvement in the Eastern Ontario Model Forest certification scheme, please rate your level of agreement or disagreement with the following statements. Please select the response that best reflects your opinion.

| | Strongly disagree | Disagree | Agree | Strongly agree | No opinion |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| a. The goals of the forest certification scheme are understandable. | | | | | |
| b. Participating in the forest certification scheme is costly. | | | | | |
| c. Participation in the forest certification scheme demonstrates commitment to responsible forest management. | | | | | |
| d. The certification program provides opportunities for education about Aboriginal people's forestry values. | | | | | |
| e. A lot of time is spent in the documentation to meet the requirements of certification. | | | | | |
| f. It is easy to realize market benefits of certification. | | | | | |
| g. It is easy to understand and prove compliance with certification standards. | | | | | |
| h. It is difficult to voice concerns regarding the certification process. | | | | | |
| i. There is a lack of transparency in forest management contract under the certification scheme. | | | | | |
| j. The certification program helps foster collaboration with Aboriginal peoples. | | | | | |
| k. Certification has led to more restrictions on harvesting practices. | | | | | |
| l. The managers of the forest certification scheme are effective in resolving conflicts. | | | | | |
| m. The forest certification scheme has helped to improve relationships with other land owners. | | | | | |
| n. The managers of the forest certification scheme are fair in their relationships with all certified forest owners. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| o. Participation in the forest certification scheme helps to meet provincial regulations on private forest ownership. | | | | | |

17. What do you think are the key successes of the forest certification program for you as a landowner / producer / forest manager / member of the certification working group etc. Please write your response in the space provided below.

18. What do you think are the key challenges of the forest certification program for you as a landowner / producer / forest manager / member of the certification working group etc. Please write your response in the space provided below.

19. If you have any recommendation for the manager of the forest certification program, please write your response in the space provided below.

**D. BACKGROUND INFORMATION**

We would like to know some basic information about you to help us in our data analysis.

20. Which gender do you most identify with?
    a. [ ] Male b. [ ] Female c. [ ] Other……

21. Do you consider yourself to be an Indigenous person? (Status Indian, Non-status Indian, Inuit, Métis)
    a. Yes [ ] b. No [ ]

22. What is your age?
    a. [ ] 20 - 24 b. [ ] 25 - 34 c. [ ] 35 - 44
    d. [ ] 45 - 54 e. [ ] 55 - 64 f. [ ] 65+

23. What is the highest level of education that you have completed?
    a. [ ] Grade 9 or Less
    b. [ ] High School Graduate
    c. [ ] Some University
    d. [ ] Graduate University Degree
    e. [ ] Some Graduate Study.
    f. [ ] Technical School or Community College
    g. [ ] University Degree (Bachelors)

24. Do you own forest land?

a. [ ] Yes b. [ ] No

25. If you answered Yes to Question 16 above, how long have you owned this forest land?
    a. [ ] 0- 5 years
    b. [ ] 6- 10 years
    c. [ ] 11- 15 years
    d. [ ] 16- 20 years
    e. [ ] 21- 25 years
    f. [ ] 26- 30 years
    g. [ ] 31- 35 years
    h. [ ] 36 40 years
    i. [ ] More than 40 years

26. Do you manage other forest land that you do not own?
    a. [ ] Yes b. [ ] No

27. What is the nature of the tenure arrangement on the forest land you manage that is not owned?
    a. Long term lease b. Yearly rent c. Other type of harvest rights, please specify (……)
28. How long have you managed the forest land that you do not own?
    a. [ ] 0- 5 years
    b. [ ] 6- 10 years
    c. [ ] 11- 15 years
    d. [ ] 16- 20 years
    e. [ ] 21- 25 years
    f. [ ] 26- 30 years
    g. [ ] 31- 35 years
    h. [ ] 36- 40 years
    i. [ ] More than 40 years

29. Please indicate the total size of the forest land you own, manage or both.

| Size of forest land | Forest land owned (Please tick) | Size of owned forest land managed | Size of forest land managed but not owned |
|---|---|---|---|
| a. Up to 10 ha | | | |
| b. 11 – 20 ha | | | |
| c. 21 – 30 ha | | | |
| d. 31 – 40 ha | | | |
| e. 41-50 | | | |
| f. above 50 ha | | | |

30. If you are a forest owner/manager, please indicate which of the following forest-related services/products that your land provides. Please choose all that may apply.

| | Check (√) |
|---|---|
| a. Wildlife watching | |
| b. Biodiversity conservation | |
| c. Protection of water resources | |
| d. Hunting and fishing | |
| e. Hiking | |
| f. Timber production | |
| g. Permanent residence | |
| h. Seasonal residence | |
| i. Cross-country skiing | |
| j. Camping | |
| k. Investment | |
| l. Non-timber forest products (e.g. Berry picking, mushrooms) | |
| m. Firewood | |
| n. Other, please specify (……) | |

31. Please indicate the category of organization(s) you represent/belong to and the number of years of being a member. Choose all that apply.

| Category of Organization | | Please check (√) | Number of years of being a member of the selected organization/group | | | |
|---|---|---|---|---|---|---|
| | | | Less than a year (√) | 1- 4 years (√) | 5 - 9 years (√) | More than 10 years (√) |
| a. | Woodlot Owners Association | | | | | |
| b. | Maple syrup producer | | | | | |
| c. | Community forest manager | | | | | |
| d. | Private forest manager | | | | | |
| e | Private forest owner | | | | | |
| f. | Member of the EOMF Certification Working Group | | | | | |
| f | Other, please specify (……) | | | | | |

This is the end of the questionnaire. We sincerely appreciate your input to the study. Please use the space below for any specific or general comments you may have about the study in general.

We are always happy to hear from you. If you have any comments, feedback or request in the future, please send those to the researcher through e-mail: jmb357@usask.ca or cell: 306-881-3307.

Thank You. Your participation will provide input into academic research and into practical recommendations for strengthening the certification program of the Eastern Ontario Model Forest.